

# AUTOMOTIVE INDUSTRIES

## AUTOMOBILE

Volume 67

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Number 13

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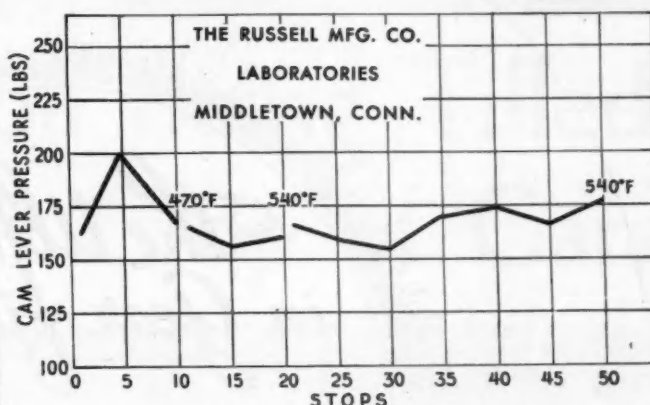
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Automotive Industries

30 consecutive stops at a temperature of  
 more than 540° F. with cast iron drum

## Yet — Practically No Fade-Out



Data: Brake, 15" mechanical-internal; drum, cast iron friction surface, steel backing; equivalent car weight, 4600 lbs.; speed, 60 m.p.h.; interval, 40 sec.; constant deceleration, 16 ft./sec.<sup>2</sup>

A major difficulty confronting car and brake manufacturers is the securing of friction materials that do not fade out under continued severe brake applications made from high speeds.

The accompanying chart shows the remarkable ability of a special Rusco Lining to retain uniform coefficient of friction when brake applications are made 40 seconds apart from a speed of 60 m.p.h. Starting at the extreme left of chart, it will be seen that the cam lever pressure varied from 163 pounds for stop No. 1 to 200 for stop No. 5 and 168 for stop No. 10. Here an inspection was made and temperature reading taken (470° F.) The next ten stops were made in the same way.

From Nos. 21 to 50 inclusive, the stops were consecutive. During this portion of the test the lining was operating at an estimated temperature of over 600°. (Actual temperature readings plus allowance for cooling while thermo-couples were being inserted between lining and drum.) Yet during these 30 consecutive stops the cam lever pressure varied only 20 pounds, indicating practically no fade-out of lining.

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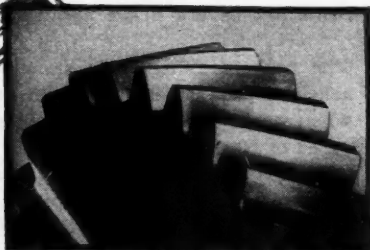
September 24, 1932

NUMBER 4  
of a  
1932 SERIES  
of  
FELLOWS  
Announcements

# REVO

## Fellows

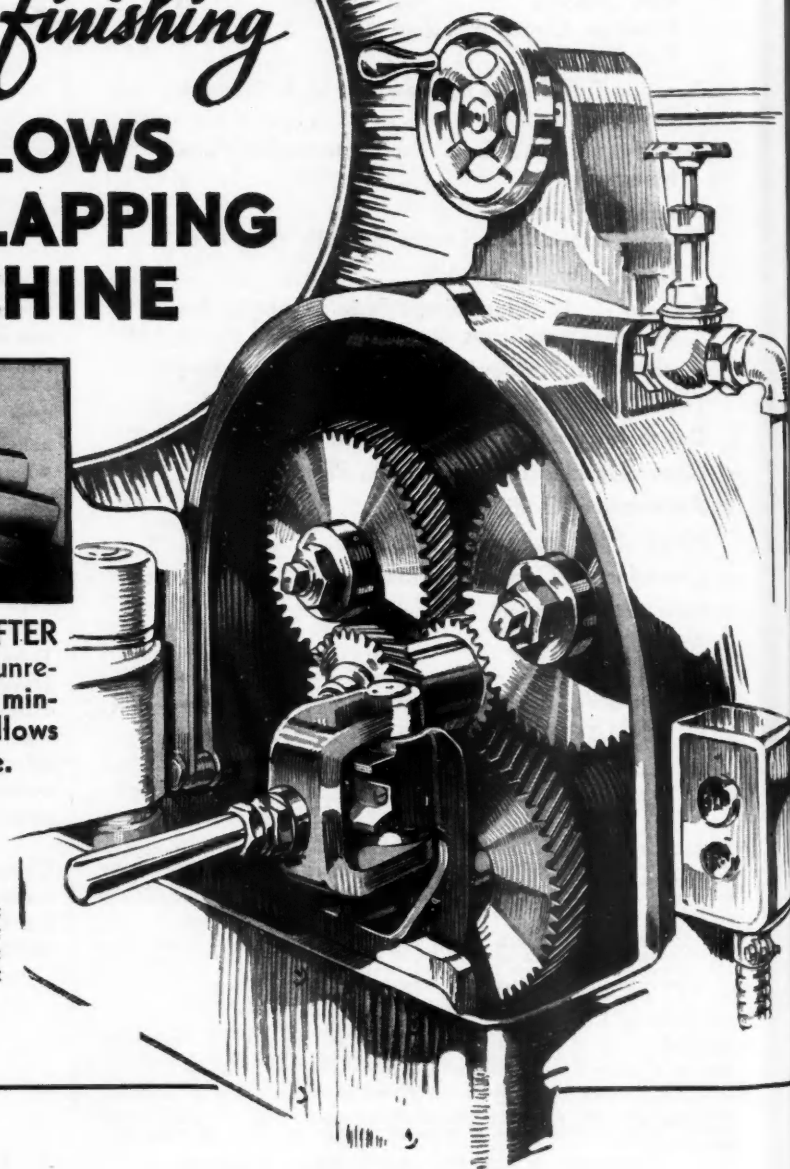
*The Ultimate  
in Gear finishing*  
**FELLOWS  
GEAR LAPPING  
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LAP FINISHED AFTER  
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#### Fellows 3-Lap Recess Type Lapping Machine

The three laps are driven by the work, their free rotation being restricted by independently adjustable brakes, and finish the entire tooth profile of the hardened gear to precision limits . . . and at a cost unapproached by any other method.



# AUTOMOTIVE INDUSTRIES

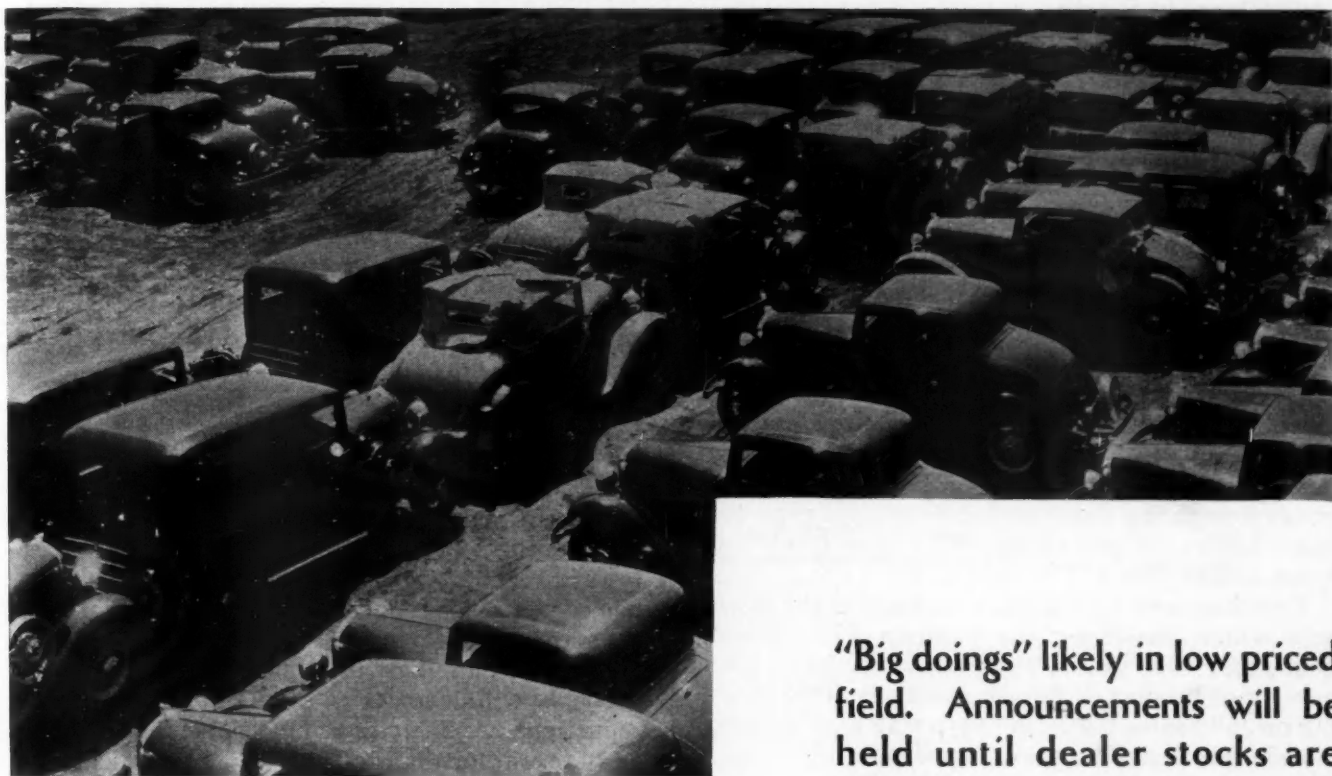
Vol. 67, No. 13

• THIRTY-FOURTH YEAR •

September 24, 1932



## New Soil Being Tilled for 1933 Crop of Cars



**"Big doings" likely in low priced field. Announcements will be held until dealer stocks are cleared. Exact prices uncertain**

by Norman G. Shidle

**W**ITH actual announcement dates more uncertain than usual at this time of year, practically every car manufacturer has his 1933 program definitely set as regards new models. Prices to be placed on the new jobs remain very much subject to alteration between now and the time they make their public appearance; in most cases no final detailed price set-ups have yet been attempted. The exact lists for the new models will depend very greatly on the condition of busi-

ness at the time the new announcements are made and—in individual instances—on what competitors do.

Actual announcement dates will depend on two elements in each case:

1. How long it takes to clear current models from dealers' floors; and,
2. When competitors announce.

There is a really strong desire on the part of the executives of nearly every individual factory with



which we have contacted recently to withhold their own new models from the public until at or very near to the time of the New York Show, which next year is scheduled for Jan. 7-14.

While some companies are certainly going to require more time than others to get rid of current inventories, nobody seems to be chafing at the bit to get the jump on his competitors in announcing. EVERYBODY, on the other hand, seems terribly afraid that his competitor will get the jump on him.

This more or less negative attitude being prevalent, it looks to us as though there were a better chance than ever before for all clean-ups to be completed in an orderly fashion and new models to remain behind closed doors until close to New York Show time. Only one important manufacturer in any given price class, however, needs to break his new lines early to cause a rapid precipitation of new jobs even before the snow flies.

### Will Clean Up Stocks

Some important makers, nevertheless, aren't going to be hurried into bringing out their 1933 cars before current stocks are thoroughly depleted, no matter what their competitors may do. And a few others aren't far enough along in completion of design and production development work to permit announcement before January, 1933, no matter what the wishes of their merchandising departments may be.

This much can be said with certainty. Nearly every factory is doing its best to stop production on its 1932 models early enough to permit a real cleaning out of dealer inventories before the end of the year. Production of old models had already ceased several weeks ago in several instances where new model announcements are not expected much before the first of the year and certainly not much before Dec. 1.

Two divergent trends will be evident in the products which passenger car builders will present next year. One group, apparently convinced that novelty of product will have relatively little bearing on 1933 sales totals, is projecting a set of new models which will contain numerous minor mechanical refinements and modifications in body lines, but which, in the main, will carry out the idea of constant improvement rather than startling innovation. In this group will be found one small and some large companies; some large production jobs and some small production jobs. The division between this and the second group, in other words, apparently comes because of different thinking as regards the economic importance of model change in 1933 rather than because of any element of size or price in itself.

On the other side of the fence will be found a group of companies, some of them associated with important and previously conservative corporations, which will probably present designs differing in a marked degree so far as bodies are con-

cerned at least with their past jobs. Interestingly enough, it is in the low priced field that we may look for some of the most startling innovations in appearance. Down in this price class where competition has been, and will continue, keenest there will be several definite bids for new or renewed leadership through the progressive appearance route.

### Innovations in Low-Priced Cars

And despite consistent talk about the high cost of body dies and the difficulty of making appearance changes in such units, we shall be surprised if the prices on some of these jobs are not at least as breath-taking as their design. While—as previously mentioned—it is too early to be able to predict with assurance in this respect, it wouldn't surprise us at all to see three or four cars with at least one or two models listing at less than \$400 and perhaps as many as five or six with a few models under the \$450 mark.

AND NONE OF THEM—except the continuing American Austin—WILL HAVE A WHEEL-BASE OF LESS THAN 103 INCHES.

It should not be thought from the foregoing statements that all the novelty and uniqueness in design are to be looked for in the lower-price ranges. There will be some striking innovations, both mechanical and otherwise, in a number of the middle and higher priced jobs as well. It is difficult not to emphasize the probabilities in the lower priced cars, however, because they seem so contrary to the normal trend in such matters.

### More Power Expected

While detailed information concerning new models in general is scarce now, it is a safe bet that they will have more power. Further progress toward real aerodynamic streamlining may be expected, with some lines embodying rather radical departures from current styles. Efforts to simplify gear-changing will continue. Tire pressures probably will be lower on the lighter cars, but the reductions are likely to be moderate; that is, to 25 or 30 lb. rather than to 10 or 15. A detailed technical improvement that is expected on some cars is the use of valve seat inserts which prolong the need for valve grindings to unbelievable mileages. In fact, if these inserts do what is expected of them, many cars so equipped will never need a valve-grinding job.

Possibly when six more months have slipped by and all of the current secrets are public property, the facts will appear to have been a bit less startling than these present prophecies would indicate. Something of the same kind happened last year. New models which sounded radical in October turned out to be cautious leanings toward new trends when they appeared in January. There are strong indications, however, that much real and visible progress will be uncovered in 1933.



# JUST AMONG OURSELVES

## Depression? Not In Designing

ALL in all, this fall should see one of the most exciting battles for dealers yet seen in the industry, and 1933 should see some new designs which will make the public sit up and take renewed notice.

Next year, moreover, won't be the end of the road in design. More than one company is already projecting for 1934 models which will outstrip anything yet made public.

With 1933 sales certain to exceed those of 1932 by a reasonable margin, the automotive industry gives more signs of life, vigor and determination for accomplishment than at any time in the last three years.

## Tool Design and Direct Labor Costs

THE objective in designing tool equipment isn't always reduction in direct labor cost. That may seem like an obvious statement, but a good many automobile men have worked so long under mass production conditions that they have sometimes forgotten just that simple truth. Production executives, used to enormous annual volumes prior to 1930, have perhaps encouraged tool designers to believe that the reduction of direct labor to a minimum was the only worth while objective.

But it isn't always. "The process of reducing cost by injection of capital in manufacturing equipment is profitable only

so long as a reasonable load factor is maintained by the investment," Louis Ruthenburg, president of Copeland Products, Inc., wrote us the other day in answer to a query of ours. "When the load factor is reduced drastically—as it has been in the last two years—" he continued, "losses accumulate much more rapidly than would be the case if processing had been simpler, labor costs higher and capital investment lower.

"It is probably unsafe to generalize about these things because specific analysis, after all, of individual cases, is the only thing that can lead to definite conclusions."

## Dizzy Dates and Dizzy Speeds

"SPEEDING in the Gay Nineties," a Mack Sennett comedy now going the rounds of the smaller movie theaters, features an automobile race in which hero Ed Martin reaches the dizzy speed of 20 m.p.h., defeating Barney Oldfield and another competitor who did 8 m.p.h.

According to a sign flashed on the screen, the race was supposed to be run at a Salem fair in 1890.

Seems to us as though the producer's historical department missed fire on its date by several years. No less an authority than P. M. Heldt confirms our own idea that there weren't any automobiles running 20 or even 8 m.p.h. in this country in 1890

—in fact there weren't any running until two years later. Not to mention that fact that Barney Oldfield was about 12 years old in 1890, if the records in our files are not awry.

All of which criticism is quite beside the point and wouldn't be made by anyone except an old crab eager to show off his meager historical knowledge of the automobile industry—we accept the nomination!

## V-8 Sales Continue to Outstrip Four

THE trend among Ford passenger car customers is distinctly to the eight. Ever since the introduction of the new four and eight-cylinder models, the latter has been providing an increasingly large proportion of total Ford sales until in July the eight out-registered the four by better than two to one.

Naturally this tendency is arousing considerable speculation as to the destiny of the four. Apparently the \$50 price differential has not been sufficient to offset the superior performance on the eight in the minds of the big majority of Ford customers.

## Cars Carry Thousands of Curious

AUTOMOBILES from 48 states of the Union as well as Mexico, the Canal Zone and the Dominion of Canada have passed through the gates of A Century of Progress Exposition since the fair grounds were open to visitors for a preview of the 1933 World's Fair last June.

Between June and September the average daily attendance increased eight-fold. During June it was 622; in July it increased to 2521 and during August it reached 5230.—N.G.S.

# Improved Planetary Transmission is As Opportune Development in Car

by P. M. Heldt

**N**OW that so much attention is centered on the transmissions of passenger cars, particularly with respect to ease of operation, the question arises as to whether there is any possibility of the planetary type of transmission coming back. With this type there is no clashing of gears, and any speed can be engaged at any time; further, no special skill is required in operating the transmission and practically anyone can drive a car equipped with it. In high gear the drive is direct, and the losses then are even less than under similar conditions in a sliding-gear or constant-mesh transmission, for there is no churning of a heavy lubricant by revolving gear wheels.

In the United States the planetary transmission for a long time was used on low-priced cars almost exclusively. This necessitated a design that was cheap to manufacture, and other desirable qualities, such as high efficiency in geared speeds, silence of operation, and long life, were more or less neglected. With one or two exceptions these transmissions provided only two forward speeds, which made it impossible to operate the engine to best advantage under certain conditions.

That only two speeds were provided was due to an impression that additional speeds could be had only at the cost of great complication. As a consequence, the planetary type of transmission fell into ill repute here, and there is little doubt that if any manufacturer of a medium or high-priced car during the past decade had attempted to fit such a transmission, he would have found it to be a sales retardant.

Cars with planetary transmissions have now been off the market for about five years, and for more than 10 years previously this transmission was fitted on only a single make of passenger car; hence, whatever unpleasant recollections the driving public may still retain of this type of transmission as formerly employed must have been considerably weakened by age. There can be little doubt, moreover, that the unpleasant experiences were due not to defects inherent in the principle of the planetary gear but to the fact that the transmissions were designed more with a view to low cost of construction than efficient operation and long life.

In England the planetary type of transmission, there known as the epicyclic type, was for many years used on a high-grade car, the Lanchester, and in recent years it has made its appearance on several other higher-priced cars, in some cases in combination with an hydraulic clutch.

When the hydraulic clutch was first adopted by the

Although only low-priced cars in America have had this type of gear-set, European cars in high-priced brackets have been equipped with highly-developed mechanisms, proving entirely satisfactory to automobile owners

Daimler Motor Co. it was used with a standard form of sliding-gear transmission and a friction clutch which had to be disengaged every time it was decided to change gear. In this combination the hydraulic clutch formed an additional member which did not take the place of any component of the conventional car chassis, but added to its cost and weight and also slightly decreased the efficiency of transmission under all conditions, so that whatever advantages it offered were secured at a not unimportant cost.

The next step, therefore, was to replace the standard transmission and friction clutch by a planetary type of transmission with preselecting mechanism which had been on the British market for some time. With this transmission, when the operator senses that he will have to change gear before long, he sets a preselecting lever on the steering column for the speed to which he desires to change, and when the proper time for making the change comes he depresses and then releases a pedal occupying the position of the usual clutch pedal, which effects the change from the speed previously used to the new one.

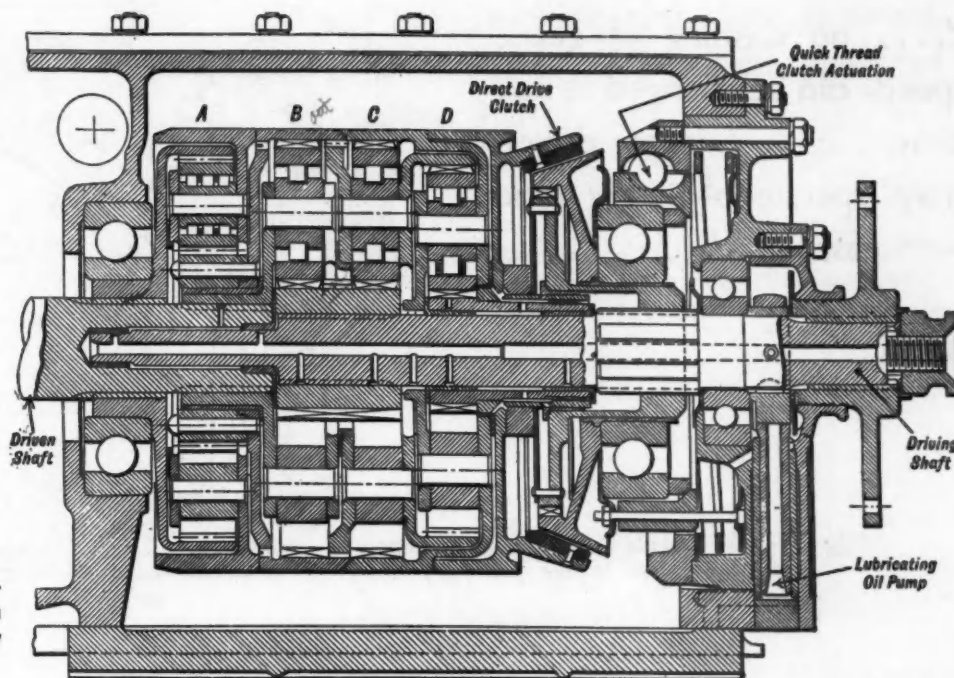
In all planetary transmissions any one gear is brought into action by frictionally locking in position a member which would rotate if it were not locked and the engine were running. This is accomplished by means of friction bands similar to friction brakes. The pedal which is depressed to make the change of speed, acts on the mechanism which tightens and loosens this friction band. During the downward stroke of the pedal the band for the gear which has been in use is released, and during the following upstroke the band for the gear to be engaged is tightened.

Among the deficiencies of the earlier American planetary transmissions were that the planetary pinions were mounted on overhanging studs, that is, studs supported on one end only; that the pinions and gears were not made of alloy steel, hardened, as used



# is Seen Design

Fig. 1—Longitudinal section through Wilson planetary transmission



in other forms of transmissions; that the planetary pinions were provided with plain bearings which it was somewhat difficult to lubricate effectively, and that the designs were such that in certain "gears" these pinions had to run at exceedingly high speeds. The remedies for most of these defects are obvious from the statements of the defects themselves. For instance, when driving torque is being transmitted through a planetary pinion, there is a force between the pinion and its supporting stud which is tangential to the circle around the axis of the gear which passes through the center of the stud. This force may be considered as centered at the center of length of the planetary pinion, and if the stud is supported at one end only, it naturally will deflect under the load on it.

Then, if the pinion is mounted on a plain bearing, the pinion must deflect with the stud, and thus will be thrown out of line with the gears with which it meshes. Efficient tooth action under these conditions is impossible, and frictional losses and wear on the gears will be increased. Therefore, for efficient operation and long life the transmission should be so designed that the studs or pins carrying the planetary pinions are supported at both ends.

## Anti-Friction Bearings

Owing to the difficulty of efficiently lubricating a bearing that revolves in space at a high rate, and also because of the inherently lower losses, the pinions should preferably be mounted on anti-friction bearings. If, besides, all pinions and gears are made of the best materials, in accordance with the latest practice in automotive transmission manufacture, a transmission should result which would be the equal of the sliding-gear and constant-mesh transmissions from the standpoints of efficiency, quietness and long life, and superior to them with respect to ease of operation.

The planetary transmission which is now being fitted on a number of British cars is the Wilson, which is manufactured by Improved Gears, Ltd., of Westmin-

ster, London. The general design of this transmission may be seen from the illustrations herewith, reproduced from *The Engineer* of London. The particular transmission here shown is intended for a railcar and does not incorporate a reverse, which latter is provided by a separate mechanism comprising three bevel gears, one driving and two driven, the latter loose on their shaft but capable of being locked thereto by dog clutches.

The railcar transmission gives five forward speeds, from which it may be gathered that it is quite possible with a planetary gear to obtain more than two forward speeds without undue complication. All control operations on the railcar transmission are effected pneumatically, two air chambers being provided on the gear box to engage either the forward-drive or the reverse-drive bevel gear on the transverse shaft, and one air cylinder by means of which the different forward speeds are engaged. The following description of the planetary assemblies and the control mechanism is taken from *The Engineer*:

The general design of the planetary transmission is shown in the longitudinal sectional view Fig. 1. The driving shaft enters the transmission at the right and extends entirely through it, its rear end being supported in a bushing in the driven shaft, which latter extends from the gear assembly at the left.

There are four planetary trains within the housing, A, B, C, and D. One of these trains, B, is the basic planetary set and the others, reacting upon it, alter the gear ratio it provides. The ratios are altered by modifying the speed of the outer wheel of the basic planetary set.

For first gear this wheel is rotated in a direction opposed to that of the driving shaft; for second gear it is stationary, and for the third and fourth it is rotating in the forward direction.

Beginning with the simplest drive, the brake is applied to planetary B, the other brakes being released. The drive then passes from the sun wheel on the driving shaft to the planet wheels, which, the outer wheel



".....no clashing of gears, speeds can be changed at any time . . . . . inapt drivers may operate planetary type with ease ....."

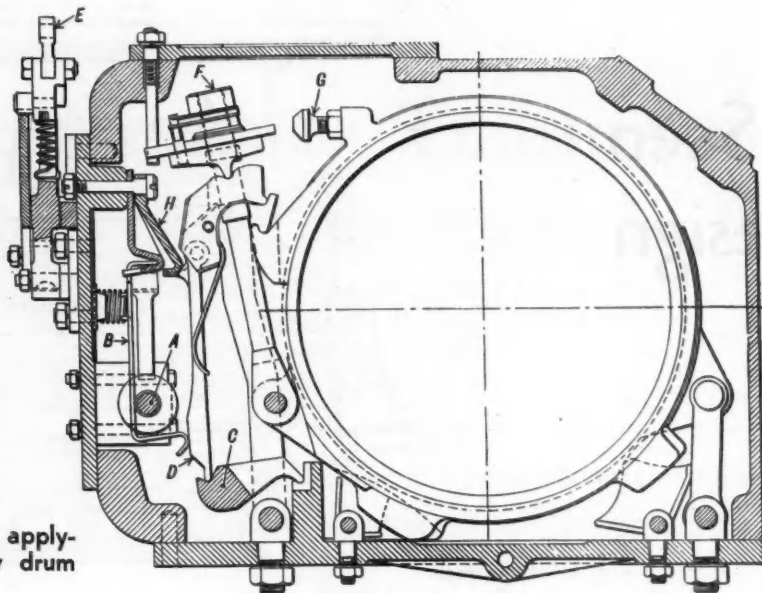


Fig. 2—Details of mechanism for applying the brake to the planetary drum

being held stationary by the brake, carry with them the planet cage, which, it will be observed, is attached to the driven shaft.

The basic planetary B alone is concerned in giving this speed which is second gear. First gear is obtained by bringing the planetary train A into use. The brake is applied to its brake ring, which, in this case, is attached to the cage carrying the planet wheels. The outer wheel of this planetary is attached to the driven shaft, and it therefore travels at the same speed as the cage of planetary B, which is also attached to that shaft.

Since the cage of planetary A is held stationary and the outer wheel is revolving in the same direction as the driving and driven shafts, the sun wheel of that planetary revolves in the opposite direction, carrying with it the outer wheel of the basic planetary B. The conditions at the latter planetary are therefore as follows. The sun wheel is revolving forwards at engine speed while the outer wheel is being rotated by train A in the reverse direction. The planet cage, therefore, travels forwards at a speed considerably slower than that at which it would move were the outer wheel stationary. As the planet cage of the basic planetary set is attached to the driven shaft, the latter also travels more slowly. In this way, first speed is provided.

### Other Brakes Released

For third speed the brake is applied to the planetary train C, all other brakes being released. The sun-wheel of this train is attached to the driving shaft, while the outer wheel is locked in position by the brake. The planet cage therefore revolves forward, carrying with it the outer wheel of the basic planetary B, and thus increasing the speed of rotation of the cage of that train, and consequently the revolutions of the driven shaft. For fourth speed, planetaries C and D react upon each other. The brake of the train D is applied. Then the sun wheel of train C drives its planet cage, which, in turn, rotates the outer wheel of train D, to which it is attached, in the forward direction. The sunwheel of train D is held by the brake. Hence the planet cage is driven in the forward direction and carries with it the outer wheel of train C, with the consequence that the planet cage of this train travels

faster than it did when its outer wheel was held. The outer wheel of the basic planetary train B is connected to the cage of train C, so that its speed also is increased, and it follows that the planet cage of B must also revolve more rapidly, and consequently the revolutions per minute of the driven shaft will also be increased.

Top or fifth gear is engaged by letting in the direct drive clutch when all the planetaries acting as a multi-plate clutch revolve together. For reasons connected with the selective mechanism, which will be explained later, it is necessary to bring the clutch into action by a rotary motion and part of the quick-acting screw mechanism can be seen behind the clutch. All the gears are lubricated from an oscillating cylinder reciprocating pump, the oil passing down a hole along the center of the driving shaft and being flung out through cross holes. The position of the pump can be seen in the drawing.

The mechanism for engaging the different gears is illustrated in Figs. 2 and 3.

Beginning with the brake bands themselves, it will be seen that each can be contracted around the planetary drum by a movement of the rod F towards the stop G. The gear engagement lever, which is not shown in the drawing, operates the bus-bar C, which extends the full length of the box. Connection between the bus-bar C and the rods F is made by means of the struts D, which are held away from the bus-bar by springs. Their lower ends rest against the plates B, which are forced against the faces of a set of cams on a cam shaft A by springs sufficiently strong to overcome those actuating the struts. Lever E is connected with the selector handle in the driver's cab, and is capable of rotating the cam shaft A. When any particular gear is selected, one of the plates B is allowed by its cam to come forward and press back the corresponding strut against the bus-bar. Owing to the fact that the bus-bar is normally in the raised position, however, the strut does not at once engage with it. As soon, however, as the driver operates the gear engagement lever in the cab, the bus-bar is lowered and the strut engages with it, with the consequence that

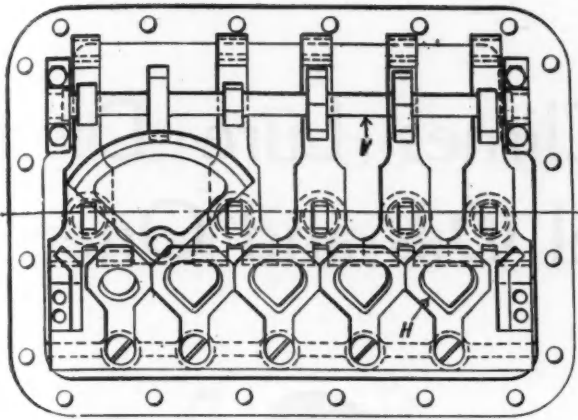


Fig. 3—Cover plate of transmission box with camshaft and other parts of gear-changing mechanism

the corresponding brake is applied when the bus-bar again rises. Another gear may be now preselected by rotating the camshaft, but the first strut cannot come out of engagement with the bus-bar until the latter is lowered once more.

It was stated when the gear-box was being described that it was necessary to bring the top gear clutch into action by a rotary motion. The reason for this necessity will now be clear, since the clutch must be actuated by a mechanism of a nature similar to that by which the brakes are applied.

### Design is Refined

There are certain refinements in the design of this preselective mechanism which are worthy of notice. The brake linings themselves are in two parts for each drum, the gap in the lining of one part being on the opposite side of the drum to that of the other. The mechanism is so arranged that the movement of the rod F contracts both simultaneously. A device is incorporated to prevent two gears being engaged simultaneously, an accident which would cause great wear of the brake linings concerned, and would generate considerable heat very rapidly. On the cover which carries the camshaft (Fig. 3) a number of curiously shaped lugs H are carried on screws in such a way that they can rock. Each of the struts has a projection. The lugs H are so spaced that the clearances between them when added together are just equal to the width of one of the projections on the struts. Consequently, since the projections must pass between the lugs before the struts can be engaged with the bus-bar, only one strut can be engaged at one time. So effective is this device that neutral gear is obtained by attempting to engage two gears at once, with the result that both the struts are held out of engagement.

In the course of time wear will take place at the brake and this time it rotates the nut and so alters the position of the fulcrum, and thus automatically takes up the wear in the brake lining.

Lastly, it is desirable that the bus-bar should be exerting the greatest force when it is in the raised position, owing to the fact that it is here that it applies the load to the brake. It is held in this position by a spring. But, of course, if this spring acted directly upon it, the least force would be exerted when

"..... in high gear drive is direct, thus losses are less than those of other types ....."

the bus-bar was raised. To get over the difficulty, the spring is arranged to act upon the bus-bar through an arm of which, by an ingenious mechanism, the length can be altered so that the moment exerted by the spring to lift the bus-bar increases, although the actual pressure provided by the spring decreases.

## Unusual Diesel Engine Developed in Denmark

A RATHER unusual type of Diesel engine has been supplied by Burmeister & Wain of Copenhagen for railcars built by the Asea Concern of Sweden for Swedish and Belgian railroads.

The engine is a six-cylinder design and operates on the two-stroke cycle. Each of the cylinders contains, in addition to the regular power piston, a piston of reduced diameter which moves in a sleeve on the cylinder head substantially in opposition to the main piston.

No poppet valves are used, but ports in the cylinder wall are uncovered by the main piston when approaching the end of its down stroke, and ports in the sleeve by the smaller piston after having started on its up-stroke. The operation of the engine is as follows:

During the up-stroke of the main and the down-stroke of the auxiliary piston, air is compressed in the cylinder, and when the pistons approach the ends of their respective strokes, fuel is injected into the combustion chamber in the usual manner. During the following down stroke of the main piston the charge in the cylinder expands.

Toward the end of the expansion stroke exhaust ports in the sleeve at the top of the cylinder are uncovered by the auxiliary piston, and the burnt gases escape. A moment later the scavenging ports at the bottom of the cylinder are uncovered by the main piston and any remaining burnt gases then are swept out by the scavenging air. This air is stored in an annular chamber between the lower part of the cylinder wall and the crankcase wall.

When the scavenging ports are closed by the main piston during its following up-stroke, the cylinder is completely filled with fresh air. The exhaust ports at the upper end of the cylinder now are also closed and the air is therefore compressed.

The eccentric is set to give a slight angular advance to the auxiliary piston, so that while the exhaust ports are opened before the scavenging ports, they close earlier than these ports.

The auxiliary piston is operated from the crankshaft through an eccentric and a rod and yoke connection. The engine develops 200 hp. at 850 r.p.m., but cylinder dimensions are not given in our source, nor is there any information regarding the type of air pump employed for the scavenging air.

# Tropical Climes Lure Diesels as Use of Fuel Oils and Onerous Taxation

Small high-speed commercial car powerplant would fit well into export requirements if such could be developed at a price comparable with gasoline engines of same size

by Joseph Geschelin

**T**ROPICS . . . intense heat . . . costly evaporation. Tropical climate dictates fuel oil instead of gasoline.

Overwhelming taxes . . . plentiful fuel oil supply. And from other quarters comes the call for automotive Diesel powerplants.

Such is the setting in many quarters of the globe served by the truck builders of this country. In one area it may be a huge potential supply of fuel oil; in another it may be excessive taxation; elsewhere it may be a question of safety hazards and losses due to evaporation. One or more of these factors seem to be drawing the attention of our foreign buyers to the virtues, such as they may be, of the automotive Diesel.

Needless to say, factory executives and engineers have given the matter plenty of thought. They know that an automotive Diesel is still in its swaddling clothes. But they have learned, too, that truck fleet operators in the United States are very much interested in any development that means a cut in operating expense.

Consequently if the export market is worth cultivating, and if it is the means of developing a good high-speed Diesel, then it may have the effect of bringing the Diesel to our domestic market so much sooner. This may be a fortunate turn of events because large volume is essential if we are to have a Diesel at anywhere near the cost of a good gasoline engine.

To be or not to be. Since it involves a knotty combination of economic as well as technical questions, we have gathered some statistics bearing on both phases in the hope that an inventory of the available information might shed a helpful light.



Far be it from us to lock horns with those eminent economists who have preached lately that export markets are only a delusion. Yet consider the facts in Table 1. Undeniably, exports have accounted for a healthy slice of U. S. production—for trucks, the ratio of exports to production has been practically three times that for passenger cars.

If the die is cast for the Diesel, in all probability it would be wanted on trucks in the class of 2½-ton and over for economic reasons. To picture this fringe of the market, Table 2 shows U. S. exports for the years from 1928-1931 inclusive and the first seven months of 1932. We make no effort to say whether or not these are impressive figures.

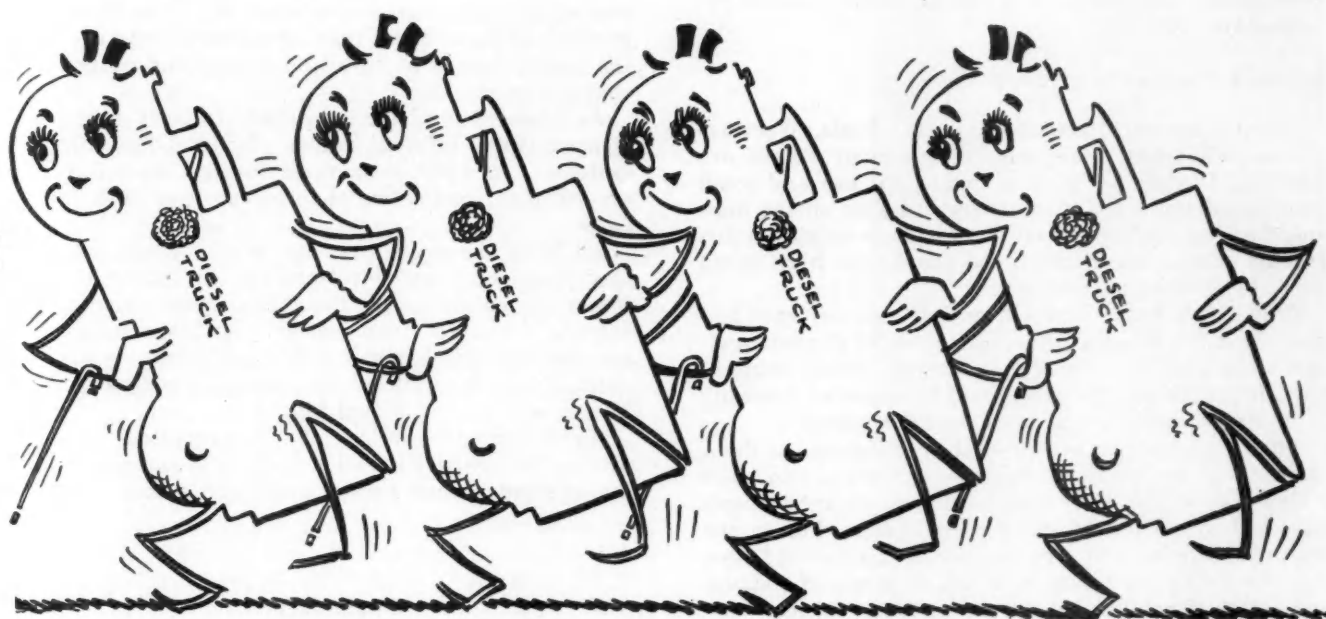
About potential markets: Table 3 is a summary of world registration of trucks and buses as of January 1, 1932. For our purpose it is important to estimate how much of this is 2½-ton and over. We find that although a precise estimate is out of the question, we can approach it with a very good guess. In the first place, a recent study by the research department of the Chilton Class Journal Co. shows that this class of units represents 6.76 per cent of U. S. registrations or about 228,367 vehicles.

Can this same ratio be applied to world registration? In reply to this query, O. P. Pearson, manager, statistical department of the N.A.C.C., says in part:

"Some time ago we made a calculation of the percentage of trucks registered in the U. S. by capacity. Our calculations were based on annual production fig-



# as Costly Evaporation Dictates Taxation Limits Gasoline Use



ures by capacity, exports by capacity over a period of years.

"In connection with that analysis we notice that the exports of over two-ton trucks from the U. S. or rather the sales abroad of trucks above two-ton capacity including Ford and Chevrolet assemblies in the foreign field, represented only 2.5 per cent. It may be, however, the foreign producers of trucks sell a relatively heavier percentage of heavy duty vehicles, but we do not have any figures on which to base a statement.

"The percentage of over 2½-ton trucks of American make is only 2½ per cent based on figures for the years from 1923 to 1929 inclusive.

"I would make the assumption that 3 per cent of the trucks in use abroad are of the 2½-ton capacity or above."

On this basis we may estimate the world registration exclusive of the United States represents at least 66,188 units. To this we can add 174,528 buses which also fit into the Diesel picture. But if we consider a potential market comprising both export and domestic needs, we get a very respectable figure with which to work.

The need for motorized transport is constantly widening. Wastes and deserts are being spanned. And with commerce expanding, there are many corners of the globe that will look to motorized trans-

"... the export Diesel market is worth cultivating .... and if it means developing a high-speed Diesel, it will bring the domestic Diesel development about that much sooner .... "

port rather than the railroads. In fact it is believed that railroad operation would be neither profitable nor practicable in these places. Here indeed is fertile territory for some of our far-flung factory organizations.

When it comes to technical details, there are so many things to consider that it would be futile to mention them in any single article. Happily the ramifications of fuel, economy, design, etc., have been thoroughly covered in a series of articles published in *Automotive Industries* this year. For convenience a complete list

Table I. Ratio of U. S. Exports to U. S. Production\*

	1923	1924	Per Cent Exported			1928	1929	1930	1931
Passenger cars.	3.4	4.6	6.4	6.2	9.5	9.6	7.4	5.7	4.1
Trucks .....	6.6	7.1	11.8	13.6	23.6	26.1	26.1	15.0	11.9

\*Statistical Issue, *Automotive Industries*, Feb. 27, 1932.

of references to this series will be found at the end of this article.

Perhaps the highest compliment paid to our engine builders is the almost unanimous opinion among engineers that we can build a good Diesel in this country if and when there is a demand for it.

And why not? Just last summer two truck manufacturers, Gramm and Indiana, announced Diesel-powered heavy-duty trucks equipped with the Cummins engine.

We know that General Motors, E. G. Budd, J. G. Brill, Public Service Transportation, and International Motor Co. among others have been experimenting with foreign Diesels and have acquired much valuable information thereby.

### Manufacturers Have Been Busy

Engine builders have been busy. Buda, Westinghouse, Waukesha, Fairbanks Morse, and others are building Diesels for general industrial use and could probably bring a lot of experience to bear on the high speed engine. International Harvester is making a fine tractor engine which might be adapted to high speed work by further refinements.

Only a few years back General Motors invested \$6,-250,000 in the Winton organization, one of the outstanding makers of marine and industrial Diesel engines. Certainly this organization could be expected to swing in on new developments when the time comes.

Thus we have rich background of experience to draw upon. But we need that and more if we are to build a Diesel according to standards of performance acceptable to truck users in the United States. For in the opinion of many engineers, neither the industrial Diesel nor the European automotive Diesel meets the standards of performance set by the gasoline engine.

Combustion and related problems have been the stumbling-blocks to high-speed Diesel development up to the present time. These have resulted in roughness, erratic idling, noisy operation, and smoky exhaust. But we have it on the authority of Mr. P. M. Heldt that much light has been shed on these problems recently. Which means that their solution may be close at hand.

There seems to be a general agreement that for truck purposes we need a small high speed six-cylinder engine comparable in performance with the present gasoline jobs. Whether or not this can be realized is a matter for conjecture, but the fact remains that a good deal of development work is going on in many quarters. People are experimenting not only with the conventional

" . . . stage is set for new truck development . . . and recently announced designs show the way to performance achievements . . . "

four-cycle engine but with two-cycle, semi-Diesel, and gasoline engines which may be convertible to Diesel by the application of an injection system and other interchangeable parts.

Announcements have been made recently concerning at least three different makes of Diesel fuel injection systems. In addition, several foreign manufacturers are offering combustion-chamber designs on a license basis.

All in all the stage seems to be pretty well set for a new phase of truck development. If export demand forces immediate action, then the domestic market will get the break so much sooner. And the indications are that the time is ripe for this move because the fleet operator is for anything that means a cut upwards of 25 per cent from his fuel bill.

No matter how you look at it the combination of export and domestic Diesel demand would spread the burden of research and tooling costs pretty thinly.

### References

- "Myths Hinder Diesel Growth," by Joseph Geschelin, *Automotive Industries*, April 16, 1932.
- "Automotive Diesels Should be Designed and Evaluated for Specific Problems," by Joseph Geschelin, *Automotive Industries*, April 23, 1932.
- "Diesels with Precombustion Chamber Meet Broad Operating Conditions," by Andrew Hornung, *Automotive Industries*, April 30, 1932.
- "Pump Characteristics Affect Diesel Engine Torque," by P. M. Heldt, *Automotive Industries*, May 28, 1932.
- "Do Diesels Have a Chance Against Gasoline Engines?" by Joseph Geschelin, *Commercial Car Journal*, June, 1932.

Table 2. U. S. Exports of Trucks 2½-Ton and Over in Capacity

	No. Units	Dollar Value	Reference
1928 . . . . .	3,099	7,769,825	Statistical Issue, <i>Automotive Industries</i> , Feb. 23, 1929
1929 . . . . .	3,445	8,975,998	Statistical Issue, <i>Automotive Industries</i> , Feb. 22, 1930
1930 . . . . .	4,258	8,894,090	Statistical Issue, <i>Automotive Industries</i> , Feb. 27, 1932
1931 . . . . .	1,375	2,449,468	Statistical Issue, <i>Automotive Industries</i> , Feb. 27, 1932
1932 . . . . . (First 7 mo.)	509	964,549	U. S. Dept. of Commerce, Automotive Div.

Table 3. Summary of World Registrations of Motor Vehicles \*

(As of January 1, 1932)		
	Trucks	Buses
Americas (except U. S.) . . . . .	345,338	17,219
Africa . . . . .	72,682	3,446
Asia . . . . .	159,790	16,862
Europe . . . . .	1,460,711	135,747
Oceania . . . . .	167,737	1,254
United States . . . . .	3,378,214	75,124
Total . . . . .	5,584,472	249,652

\* Statistical Issue, *Automotive Industries*, Feb. 27, 1932.

# Taxation Tidal Wave is Swamping U. S. Business

by M. L. Pulcher

President, Federal Motor Truck Co.

**T**WENTY-FIVE per cent of a billion dollar tax bill passed by Washington a few months ago is directed at the automotive industry. Motor vehicles and accessories are estimated to yield \$55,000,000.

There is a tax on inner tubes, casings, lubricating oil and gasoline which, combined, makes a grand total of \$273,000,000. And the eyes of the nation look to this great industry as the Moses that will lead them out of the wilderness onto the road to progress and prosperity.

Perhaps few people have really stopped to think what this staggering burden means to an industry that is already overtaxed almost beyond endurance. To the motor truck branch of the industry, this is particularly distressing.

Trucks have been paying at the rate of \$293,000,000 yearly in taxes, which represents approximately 28 per cent of the total tax paid by motor vehicles—although trucks represent only about 12 per cent of all automotive vehicles. Add to this tremendous total the new taxes which have just been levied, then figure out the result for yourself, if you can.

Consider, also, what a blow this will be to the country-at-large, not only by handicapping the motor truck industry in doing its part to promote prosperity, but in clogging the wheels of industry and distribution. There are today 3,500,000 trucks on the highways, because American industry and the American public must have rapid, dependable, flexible, economical transportation.

Green vegetables and perishable fruits are hauled over-night as far as 300 miles. The equivalent of more than a thousand car-loads of peaches is hauled yearly from farms in New Jersey to New York City. Seventy-three per cent of the shipments of produce from southern Michigan for distances of 20 miles are by trucks.

Here's a point which cannot be too strongly impressed on public consciousness—that every boost in motor truck taxation raises transportation costs, *which in turn must be shouldered by the ultimate buyer of the commodity hauled.* And the cost would be infinitely greater in many ways if taxation should continue to the point where the truck is forced off the highways. There are sections of this country which would actually go back to the "oil-lamp days." Without trucks, hundreds of communities which sprung up during the increase of truck traffic would be denied transportation service. News would be history by the time the farmer got his daily paper. The consumer, instead of having merchandise brought to his door, would have to go to the store regardless of distance.

The speedy, dependable service provided by trucks in hauling all lines of merchandise enables the man who is employed, or whose business is located in the



" . . . . It is high time . . . .  
let's swing into action . . . . "

city, to live in suburban communities, or even in the country. Without the motor truck he and his family would be deprived of the substantial benefits of such an arrangement. How would he get his supply of groceries and fresh meats, butter, eggs, milk and other necessities of life with sufficient regularity and dependability to make possible the pleasure and comfort of such a plan of living? Imagine trying to keep clothes properly laundered, dry-cleaned and pressed under conditions which would prevail in the absence of the motor truck!

Protests voiced by powerful organizations of truck owners are stemming the tidal wave of unjust legislation in many states. Industries in all lines apparently realize that some effective action must be taken to secure for commercial haulage that consideration in the matter of taxation which will enable it to perform, with utmost economy and efficiency, its vital function in the distribution of merchandise.

It is high time for motor truck owners in every state of the Union to make themselves felt. This can be done only by strong organization. As Napoleon said, "The way to insure victory is to always meet the enemy at the main point of attack with a superior force." Let's swing into action.



# Two-Ply Stainless Steel for Automotive P

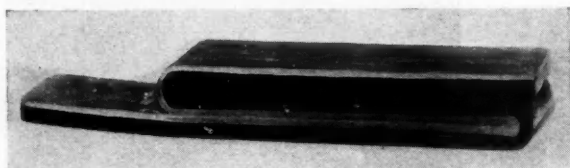


Fig. 1 — Short radius bends in two-ply stainless steel do not rupture the bond between the stainless steel surface and the mild steel back

by S. L. Ingersoll\*

ONE of the first industries to accept and use Ing-O-Clad, our new two-ply stainless steel, was the automotive industry, which employed this combination metal for the central element of wooden spoke artillery type wheels, body hardware, and bumpers.

For nearly ten years, experimentation in the industry has gone forward in an attempt to produce a combination metal. A two-ply stainless clad metal was the apparent solution to the problem, but, until recently, no successful method was evolved which would assure (in large tonnage production) a perfect weld between the stainless surface and the base metal.

Our company had successfully produced many two-ply metals, but had never been able to successfully bring together on a large production basis such remotely related members of the steel family as stainless and mild steel until very recently.

The method employed consists of rolling the finished sheets of the stainless clad mild steel from a composite ingot. The stainless surfaces are polished before the mild steel is applied in a manner which eliminates any possibility of scale, pit marks, slivers or roll marks appearing on the stainless surface during the rolling process. The process of combining the two metals in the ingot assures a complete and perfect welding throughout the entire surface of the sheets.

The process enables us to employ any one of many formulas for the stainless steel surface, embraced in our several license agreements which cover the various stainless alloys for which there are large tonnage potentialities. It further assures not only a complete uniformity of thickness of both the stainless and mild

\*Vice-president, director of research, Ingersoll Steel & Disc Company, Chicago (a division of Borg-Warner Corp.).

**New composite metal offers stainless steel advantages at much lower costs**

steel plies, but also allows the producer to vary the thickness of each ply to produce a finished two-ply sheet or plate of any commercially practical size.

There are several aspects in the fabrication of this two-ply stainless steel which merit the attention of the automotive equipment manufacturer. With its usual small percentage of stainless surface, the sheets or plates may be deep-drawn, stamped, formed, welded and highly polished. It offers possibilities in the form of tubes and pipes, bars and shapes, as well as sheets.

The two-ply stainless is adaptable to welding by gas or electric-welding methods. The method of welding has been thoroughly worked out with the leading gas and electric-welding companies, and they should be consulted as to procedures. Depending upon the various gages of the two-ply metal, these companies have developed thoroughly successful methods for produc-

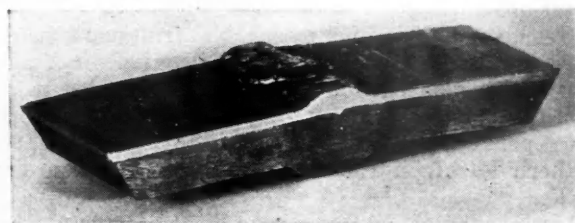


Fig. 2—Standard butt weld of two-ply stainless steel using stainless steel welding rod on upper surface to preserve continuity of stainless surface. Low carbon steel welding rod used on mild steel ply

ing lap, butt, "V" and flange welds, which assure a perfect weld embodying the stainless characteristics of the stainless surface.

For the thinner gages, as from 16 to 10 gage, a close-fitting butt-weld may be made, using a stainless steel welding rod. The weld should be made from the stain-

# Parts Manufacturing

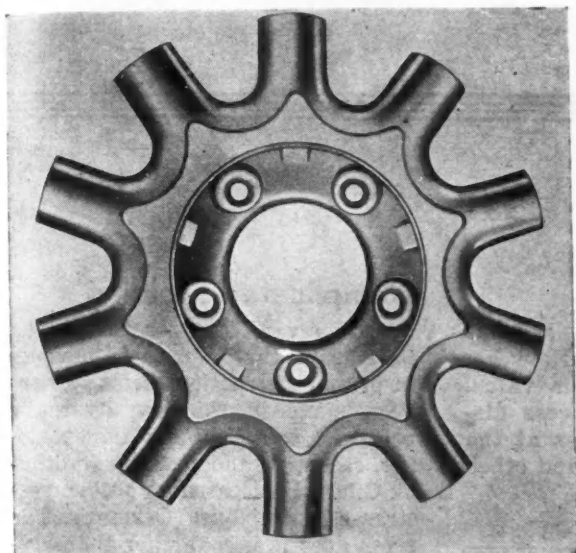


Fig. 3—Stamping of two-ply stainless steel used in artillery type automobile wheel

less side, and, with the proper amperage for the various thicknesses of plate, a homogeneous stainless weld for both plies is effected.

For the thicker gages, it is recommended that the

edges of plate should be V-ed from either the stainless or the mild steel side. To reach the bottom of the "V," a small gage welding rod is recommended, using larger rods as the mouth of the "V" is approached. As the weld gets well beyond the stainless ply, it may be completed, using less expensive welding rods than the stainless, at the same time assuring a perfect junction between the two different metals.

The present selling price of the two-ply stainless clad steel is from 40 per cent to 50 per cent less than the cost of solid metals of like characteristics, which will bring it within the reach of countless applications where the resistance of a stainless surface has been desirable but where the cost of the solid metal has made its use uneconomical.

The character of the two-ply metal limits its use to those applications where a continuous surface is exposed to corrosion, heat or abrasion. Thus it will not ordinarily be used where the application involves piercing the metal, such as screens, drains, etc.

The works manager in the automotive product factories may employ the stainless clad metal for varnish, paint, lacquer and acid storage and cooking vats, tanks, and kettles to reduce maintenance costs and lengthen the life of equipment of this type. In the actual production end of the industry, it will prove economical for radiator shells, hub caps, lamp shells, cowl and running board moldings, body hardware, wheels, bumpers and miscellaneous trim.

In applications where some degree of protection or polish is desired on the mild steel side, as well as that furnished by the stainless surface, the carbon steel side may be given a low-temperature enamel coating; it may be protected by aluminum, asphaltic or other resistant paints; and it may be plated by parkerizing, the Udylite process, and others.

## Stinson Develops Airliner With Three 240 hp. Lycoming Engines

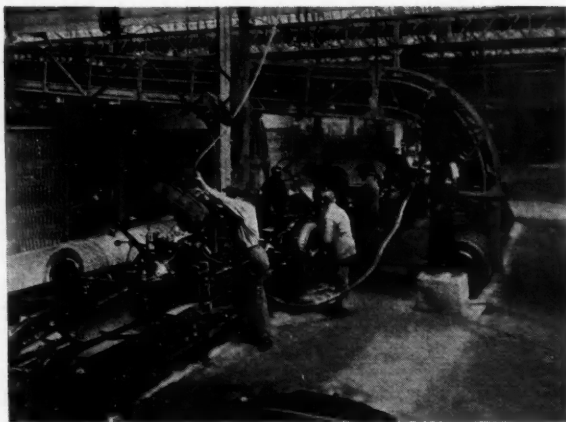
A NEW trimotored airliner permitting of a cruising speed of 121 m.p.h. was announced recently by the Stinson Aircraft Corp. of Wayne, Mich. It is equipped with three 240-hp. Lycoming radial transport engines.

As compared with previous Stinson airliners, the cabin is 7 in. wider, and also greater in height, and the increased cabin room thus provided has permitted the installation of more comfortable chairs, with double arm rests, higher backs, wider seats and head rest. Chairs are also more widely spaced, thus providing more leg room. There is now a hat rack in the cabin, and it is no longer necessary to put hats and coats under the chairs. Individual reading lamps are provided, suitably shaded.

The cabin is well ventilated, the air being completely

renewed every four minutes, and the heating system is said to have sufficient capacity so that with an outside temperature of minus 20 deg., a temperature of 70 deg. Fahr. can be maintained within the cabin. While the pilot regulates the temperature for the whole plane, each passenger may regulate the amount of heat that comes into his section. By the use of a balsam wood deadening material, noise in the cabin has been minimized.

The cockpit of the plane is considerably larger and more roomy than in the previous model. Flying and control instruments have been so placed and arranged that the pilot can reach them with little effort. The new V-type windshield has added greatly to pilot visibility, and this, with the lowering of the two outboard engines, makes landings more easy and safer.



Wheel chutes above the final assembly line at Javel are carefully designed. Note workman filling gasoline tanks and radiators just before wheels are bolted on

# PRODUCTION LINES

## Short Cuts Pay

An announcement comes from Graham to the effect that a planned standardization program is saving lots of money. For instance, the new six uses the same body dies as the eight. Also the chassis frame is the same except for length. Which reminds us that this sort of planning is the theme song of a recent article by yours truly. Look up "Short Cuts May Blaze the Trail to New Designs Without Excessive Cost," *Automotive Industries*, July 30, 1932.

## Carrying On

Two more simplified practice recommendations of the Bureau of Standards have been approved by industry and will become effective Oct. 1, 1932. R45-32 is a standard for grinding wheels and includes some new sizes to meet current needs. R89-32 brings up to date the standardization of coated abrasive products. So the good work goes on.

## Restore the Balance

Ten points of unbalance in our economic crankshaft which tend to upset business stability are advanced by Ralph E. Flanders, vp. of J & L, in *Mechanical Engineering* for September, 1932. He is disturbed to find so few real balancing forces. He recommends the problem as a serious matter for study by the engineering profession. In turn we recommend a reading of "The Economics of Machine Production"

## In the Navy

Speaking of suggestion systems for the factory, the U. S. Navy has formally recognized their value. According to a recent press dispatch, "Civilian employees at the Philadelphia Navy Yard and other

### Production Men

This is your page.

Any suggestions you have on new methods or kinks may be of value to men in other factories.

If you are working on some new development, we'd like to know about it—even if not for publication with your company's name.

naval stations who make suggestions which result in improvements or economy in manufacturing processes or material are to be given awards as determined by a board, the membership of which has been announced by the Secretary of the Navy."

## Keeping Time

Clark Gable (of the movies) has a life story running in the *Evening Bulletin* (Phila.). Current instalments deal with his connection in the automotive industry. He needed a job and grabbed for one offered by an Akron rubber company. The job was timekeeper. Instinctively he felt qualified because he could tell time by any clock.

## Complicated Molding

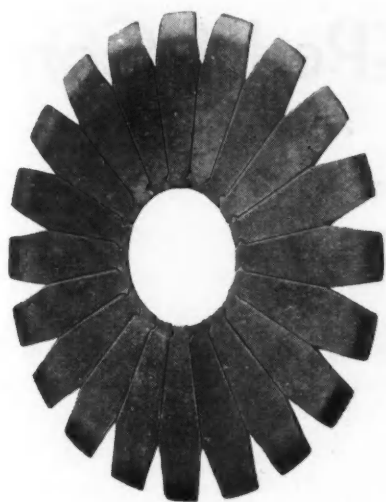
*The Durez Molder* for September, 1932, says that a notable advance in press construction seems to have been made in the new hydraulic press for complicated plastic molding, recently announced by Hydraulik G.M.B.H., located on Mülheimerstrasse 72, Duisburg, Germany. The press goes a step farther than previously known angle presses which merely allowed for vertical separation of the mold. It has four main cylinders, the vertical molding cylinder, two horizontal molding cylinders, and one hydraulic ejecting cylinder, all with hydraulic pull-backs, and all with provision for individual operation. Less expensive dies can be used, being assembled from flat plates.

## Try Veneer

Some interesting applications of Plywood, a fabricated wood product in which sheets of veneer are combined with grain of adjacent sheets crossing, are described in *Mechanical Engineering* for September, 1932, by Thomas D. Perry. It seems that the Mengel Body Co. has already experimented with Plywood construction for composite body parts. The latter also has done some interesting work on long irregular shapes such as might be demanded for streamline bodies. For acoustical and insulating purposes, Plywood may be combined with an insulating material, thus providing a decorative wood finish for the exterior.—J.G.

**M**ANUFACTURING  
MANAGEMENT  
METALLURGY





Spring-lever assembly of Lipe clutch

## Twenty Interlocking Levers Smooth Action of Lipe Automatic Clutch

This clutch is a self-contained unit made in four sizes and torque capacities of 160 to 350 lb.-ft.

W. C. LIPE, Inc., Syracuse, N. Y., is now manufacturing a new type of automotive clutch, for which it is claimed that it is smooth in engagement; that loss of spring pressure due to wear is automatically compensated for; that the only means of adjustment provided does not disturb the dynamic balance and prevents incorrect adjustments in the field; that there can be no localized heating, and that the clutch has great heat-absorbing and heat-radiating capacity, resulting in long life of the lining and the pressure plate.

Twenty interlocked pressure levers are so arranged that centrifugal force acting on them assists the clutch spring when the clutch is engaged, and opposes or weakens this spring when the clutch is disengaged. It is this feature that results in the smooth engagement and automatic compensation for loss of spring pressure due to wear of the facings.

The clutch spring does not contact directly with the pressure plate, and is therefore well insulated from the source of heat. The pressure of the spring is multiplied by levers acting on the pressure plate, and since these levers form a disk, or dial plate, the pressure is uniformly distributed and its application will not deform the pressure plate.

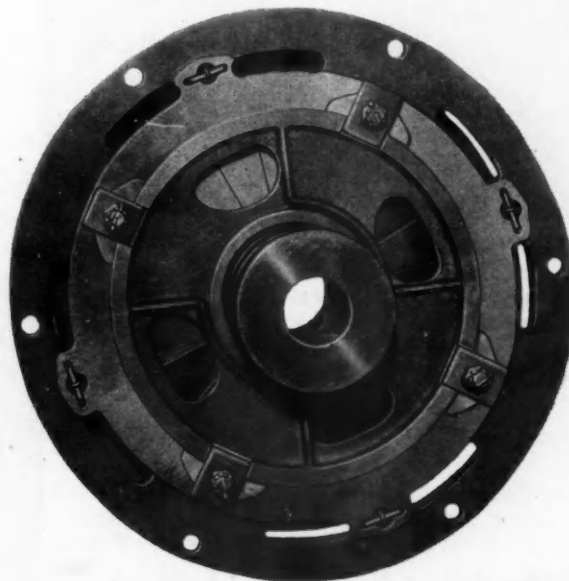
Engagement of the clutch is said to be exceptionally smooth, which is attributed to the spring levers and the pressure plate arrangement, which latter causes the plate to move absolutely parallel to the rear face of the flywheel when the clutch is being engaged. With this arrangement, the whole of the friction surface is being utilized at every stage of the engagement.

In conventional clutches, as the facings wear, the unit pressure on the linings decreases, and there is a consequent loss in capacity of the clutch. In the W. C. Lipe clutch, as lining wear occurs, the levers gradually move into a position of greater inclination, and centrifugal force acting on them has the effect of increasing the force of the clutch spring. As a result, the torque capacity of the clutch, instead of decreasing, increases with wear of the facings.

The smooth engagement of the clutch is of particu-

lar importance in truck work. These vehicles are frequently overloaded, and some drivers are in the habit, when in a difficult position due to overloading and possibly bad roads, of speeding up the engine to the limit and then engaging the clutch suddenly, thereby throwing enormous stresses on all parts of the transmission. A clutch which will not grab naturally eases these stresses. We are informed that the clutch is specially adjusted or graduated with respect to smoothness of action for every individual car model. This is accomplished by increasing or decreasing a short offset at the outer end of the levers, so as to increase or decrease the effect of centrifugal force on the levers.

The clutch is adjusted by the removal of shims, and only one adjustment is necessary to obtain all the permissible wear of the facings. By predetermining the  
(Turn to page 409, please)



Lipe heavy-duty friction clutch

# Federal Truck Has Single-Pedal Control for

Particular effort has been made to render the major units easily accessible for service

**A** DOOR-TO-DOOR delivery wagon has been announced by the Federal Motor Truck Co., Detroit. As is usual with this type of vehicle, it can be operated by the driver either sitting or standing, and it has a folding seat and a "frame cut-out" amidships.

As far as possible, the chassis is assembled of units also used in other Federal models. Thus the engine is a Continental W-10, with special manifolding, carburetor and generator to better adapt it to door-to-door delivery service. Axles are of the same type as used in the Federal Model D-3, but with a smaller reduction ratio to reduce the engine speed for a given car speed—an important item in a vehicle of this type which is driven a large part of the time in second or third gear. Transmissions are Warner Gear T-9 models.

A house-to-house delivery wagon should be so designed that it can be operated by the driver either

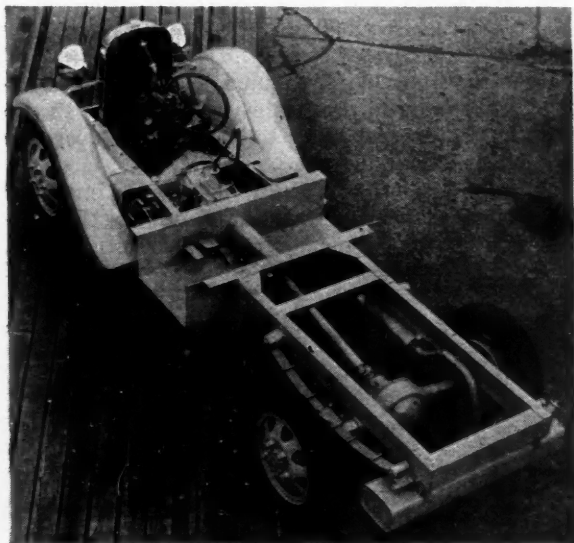
in the conventional manner or standing up. In the latter case it is preferable that a single pedal perform all the ordinary functions usually performed by the accelerator, clutch and brake pedals. Federal engineers have worked out a new control system for this vehicle which comprises three pedals. Referring to the view of the inside of the cab, the pedal at the right is the conventional accelerator. The one to the left is a clutch pedal for sitting drive and for gear shifting. The center pedal is a combination brake and clutch pedal to which is connected an automatic engine-speed regulator.

This latter pedal is the one used for house-to-house stops, the driver leaving the vehicle in gear at such times. When he wishes to stop he merely steps on this pedal, for which a ratchet catch is provided, tripped with the pedal itself. Depressing the pedal results in mechanically disengaging the clutch, applying the brakes and throttling the engine down to idling.

To start again, the driver releases the pedal, which releases the brakes, lets in the clutch and at the same time speeds up the engine to the setting predetermined by a conventional dash throttle control.

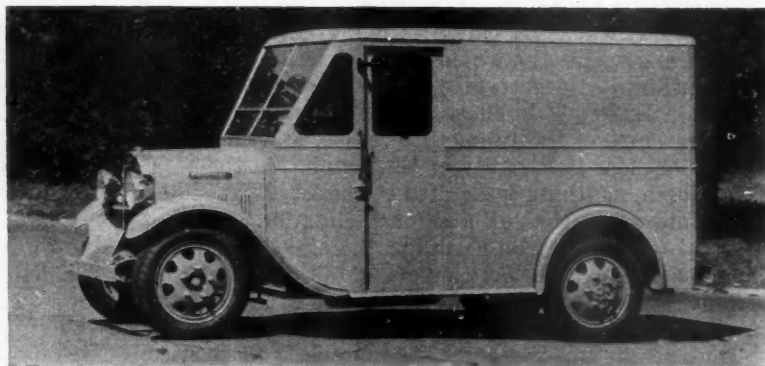
This engine-speed regulator is obtained by an ingenious method. In the intake system there are three butterfly valves—the normal carburetor butterfly actuated by the dash throttle control and the foot accelerator, an upper butterfly forming part of the Handy engine speed governor for maximum speed, and a third butterfly valve between these two, operated by an extension on the end of the clutch pedal—which pedal, of course, is actuated by the "single control pedal" when the latter is being used.

Thus when the clutch is disengaged, the center butterfly valve is closed, reducing engine speed to idling. When the clutch is engaged, the special butterfly is wide open, and engine speed is then regulated by the regulation carburetor throttle valve, limited only by the engine speed governor. The additional

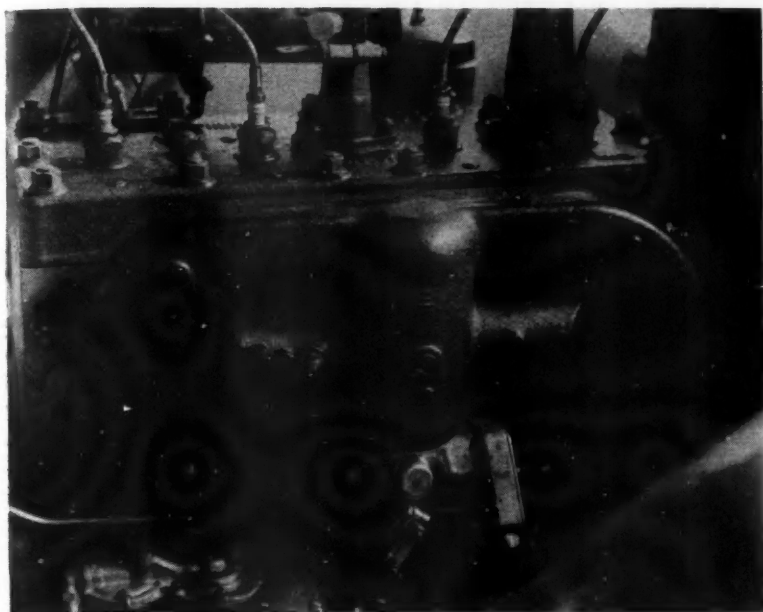


Top view of the new Federal unit, showing the reinforcements at the frame, cut-out, the removable propeller shaft tunnel or cover, and the three operating pedals. The center pedal is the one used for standing drive

New Federal door-to-door delivery unit



# for Door-to-Door Stops



Interior detail giving an idea of the visibility. Note how the seat folds out of the way when not in use

Detail of right side of Federal milk delivery unit engine, showing the "hot" type intake manifold, governor, and connections for the intermediate or "third finger" butterfly

valve is carried in a small special casting fitted between the carburetor and the governor.

To produce good idling characteristics with this set-up, the carburetor idling jet passage is continued up through the special casting to the additional butterfly. Here a small spring loaded ball check is provided, keeping this part of the passage normally closed. Under this condition the fuel mixture supply for idling and accelerating is supplied in the normal manner. When the engine is automatically throttled by a depression of the clutch or brake pedal, the center butterfly in closing depresses the ball, opening the jet and permitting gasoline to enter above this valve.

An equalizer or air bleed is also provided to take care of the variation in pressure above and below the new butterfly. This is in the form of a short exterior copper tube, which prevents too rich a mixture being supplied while idling (with the center butterfly closed).

To further the idling characteristics, the intake manifold is made of the "hot" type, with a large heat-interchange chamber. Moreover, since the engine probably will be running at low speeds (or idling) a good deal of the time, the generator is designed to cut in at lower speeds than usual.

Engine accessories include an air cleaner and Puro-lator. The battery is located under the floor board to the left and back of the steering column, where it is readily accessible.

Particularly efforts have been made to render the major units easily accessible for service. The propeller shaft "tunnel" in the dropped section of the frame does not form a structural part of the body but is readily removable. When removed, the front uni-

versal is exposed for greasing or disconnection for removal of transmission or clutch, etc. These units are dropped for removal. The clutch is large, with an 11-in. plate, and provided with a ball thrust bearing. Transmissions are of the four-speed type, with sliding spur gears.

Reinforcements for the body at the center frame cut-out are in the form of well-ribbed heavy castings, as may also be noted from the illustrations. Brakes are four-wheel hydraulics, wheels are Spokesteel demountables, with 6.00 in. section balloons at the front and 32 x 6 in. high pressure pneumatics at the rear.

The rear-axle gear ratio is in the neighborhood of 5.1 to one for the bevel gear final reduction. This corresponds to approximately 1600 r.p.m. engine speed at 30 m.p.h.

The doors, which are of the sliding type, are hung on the inside with locks located in the front door pillars rather than in the doors themselves. Bodies are lined with plywood throughout, with sheet steel protective panels over the lower halves of the body side and rear panels.

The seat has a folding back. When not in use it folds and slides out of way against the dash to the left and ahead of the steering wheel.

The need for frequent adjustment of the automatic throttle on account of brake and clutch wear is obviated by transmitting the operating force through a coil spring, located in the linkage at the clutch pedal. The cross rod for operating this butterfly is in the form of a shaft carried within the tubular cross-rod actuating the carburetor throttle from the accelerator pedal. The vehicle weighs approximately 4300 lb.



## Gasket Material Developed by G. E. Laboratory Is Impervious to Hot Oil, Acids and Alkali

A NEW gasket material that is said not to be affected by hot oil has been developed in the General Electric research laboratory at Schenectady. The exposed edge of the gasket is not attacked, nor does the oil penetrate it. Oil-filled assemblies have been operated on test at from 210 to 230 deg. F. for a year without effect on the gasket and without leaks.

The compound may be used in contact with cemented joints; neither dilute acids nor dilute alkaline solutions affect the compound.

Designated as No. 1281 gasket compound, the material is a gray or brown, odorless and sulphur-free alkyd resin material, for which Glyptal is the G. E. trade name. It is flexible and practically incompressible, and there is no noticeable hardening or stiffening in outdoor exposure tests. At temperatures below zero Fahrenheit the compound is somewhat brittle, but this does not affect its efficiency as a gasket when assembled in a joint.

Bushing assemblies of the compound with porcelain, brass, cast iron and copper have withstood alternate heating and cooling while under pressure and in contact with oil for long periods of time.

Among applications recommended are those where resistance to hot oil is of primary importance, where exposure to naphtha, gasoline, kerosene, benzene and similar solvents may occur, where moisture is to be excluded and oil resisted, where there may be prolonged

exposure to ozone, and where electric corona may occur.

For bolted joints the gasket should be as thin as the strength of the parts and the nature of the surfaces will permit. Thicker gaskets are desirable for screw joints. The gaskets should be as wide as practical. The faces of the gasket should be covered as completely as possible by the clamping assembly so that minimum area is exposed, and, whenever possible, an enclosed gasket should be used.

The gaskets must be used under compression, with the clamping surfaces drawn up evenly so that compression is uniform. Allowance should be made for transverse distortion during clamping.

A sticker is not required for most applications, but where conditions to which the gasket is exposed are severe, as in salt water exposure, etc., a pigmented "Glyptal" varnish (No. 1201) may be used as a cement and as a protective film. For screw joints the gasket should be lubricated with a thin film of mineral oil at the time of assembly, to permit the parts to slide easily upon the gasket.

At present the material can be obtained in sheets up to 13 by 36 in. in thicknesses from one mil to one-eighth inch. Round gaskets available at present have a maximum diameter of 12½ in. and a maximum thickness of ⅛ in., but larger sizes will be made available at a later date.

## Tool Department Fixture Saves Time

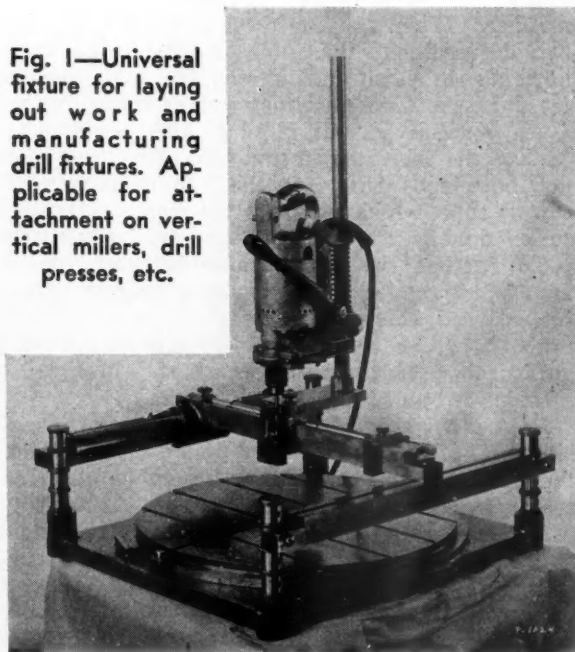
SEVERAL new aids for the production tool department are offered by the Reed-Prentice Corp., Worcester, Mass. The one in Fig. 1 is a universal fixture for laying out work as well as manufacturing drill fixtures with holes up to ½ in. in diameter. It is made in two sizes only, one with a 12 in. diameter rotary table, the other with a 20 in. diameter rotary table. The standard height under cross bar on the 12 in. size is 10 in., the standard height on the 20 in. size is 12 in. Additional height can be secured by lengthening the posts.

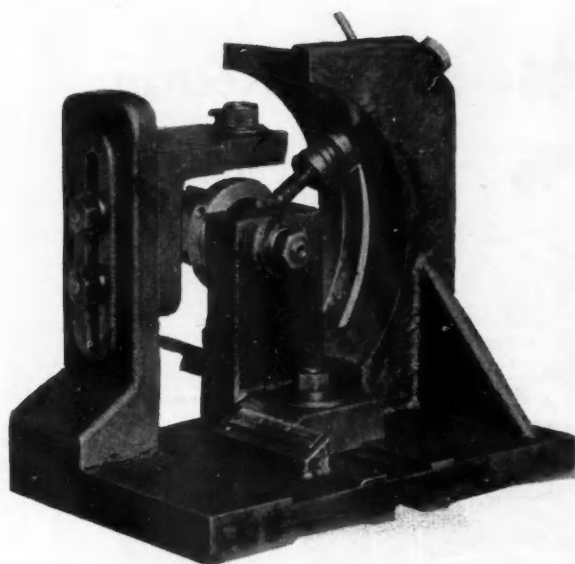
The rotary table is graduated in minutes and is said to be very accurate for indexing. The cross bar as well as the circular longitudinal bar is arranged so that end measures with micrometers can be used for spacing in either direction. The drill is guided for either spotting or drilling, and the attachment can be swung so that the drill can be used either on the back or the front of the cross bar.

The outside diameter of the drill bushing on the 12 in. size is 1 in. and on the 20 in. size it is 1¼ in. Drill bushings with this outside diameter can be used up to capacity of ⅜ in. on the 12 in. size and ⅝ in. diameter on the 20 in. size.

The fixture can be used in a vertical milling machine

Fig. 1—Universal fixture for laying out work and manufacturing drill fixtures. Applicable for attachment on vertical millers, drill presses, etc.





or drill press, thus eliminating the electric drill. In addition to the spotting and drilling, the attachment is arranged so that milling of templates can be readily performed, using the circular table for the radius sections as well as the angular sections, while the straight milling can be performed by moving the cross or longitudinal bar.

In Fig. 2 is shown a universal ring drilling fixture designed for drilling holes on the outside diameter of circular pieces such as collars, etc. In capacity this fixture will take  $1\frac{1}{4}$  in. minimum diameter; 6 in. maximum. Holes can be drilled to the center of 6 in. ring and may range from  $\frac{1}{8}$  to  $\frac{5}{8}$  in. diameter drill.

Fig. 2—Universal ring drilling fixture designed for drilling on the periphery of circular work up to 6 in. diameter

## Dowmetal Used in 4-Car Trailer

A TRAILER for the over-the-road delivery of automobiles, in which most of the important parts are of Dowmetal, a magnesium alloy, has been built recently and shows a great saving in weight as compared with similar design in steel and provided with a wooden floor.

The trailer will carry four medium-sized passenger cars or two small passenger cars and two dual-wheeled trucks. It is floored with heavy Dowmetal plates and provided with stakes and side rails of Dowmetal which adapt the trailer for the carrying of general freight.

The total weight of this trailer is 4180 lb. Without the flooring, stakes and side rails (which are not needed for the transportation of cars) the weight is only 2850 lb. This compares with 8700 lb. for a wooden-floored steel trailer and with 5700 lb. for a steel trailer without flooring. Since with the light-alloy trailer the reduction in weight to be hauled by the tractor is more than two tons, it is obvious that

the operating cost is considerably reduced as well.

The trailer is loaded from the rear by one man, using the hinged loading device shown. The ramp, loading device and rear skids are surfaced with Dowmetal subway grating which provides a non-skid surface when wet or dry. The skids weigh only 60 lb. each. Fabrication of the Dowmetal frame is held to close limits and a large safety factor is assured.

A 28-ft. trailer, designed to haul four cars of Buick size, keeping within the 40-ft. overhaul length specified by some states, is now under construction. It is streamlined and has a capacity for eight tons of general freight in the 800 cu. ft. weatherproof body. Weighing 3800 lb., it can be handled easily by a  $1\frac{1}{2}$ -ton tractor when loaded with cars averaging 3400 lb. each, and offers a solution to the problem of transporting new automobiles in states with severe restrictions regarding trailer lengths. Dowmetal is a product of the Dow Chemical Co., Midland, Mich.

## Chevrolet Has Unique Service Parts Record

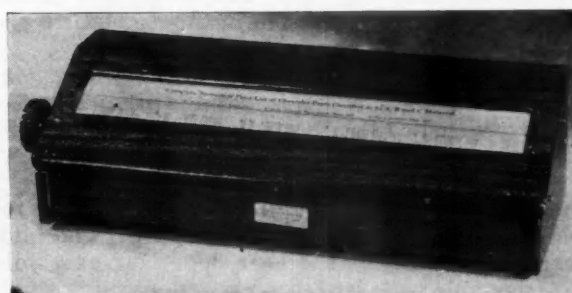
CHEVROLET MOTOR CO. in its headquarters, regional and zone offices is using an interesting "scroll" machine instead of a catalog for ready reference on information relating to service parts, parts prices, parts affected by failures of others in the checking of complaints, etc.

The device is quite similar, in enlarged form, to the scroll device sometimes used for reference to telephone numbers. A glass covered aperture in the cover of a neat box containing the mechanism shows the information desired, when a control knob on one side is spun to the correct position. Parts records, complaint codes, etc., are printed on a long sheet of paper and wound on two rolls inside the case.

The device is most widely used for the checking of complaints, for the checking of returned parts under the warranty clause, for the checking of warranty labor 50 per cent rebates to dealers, etc. Approximately 250 to 300 such machines are used at

various points, with an average probably of two per zone office.

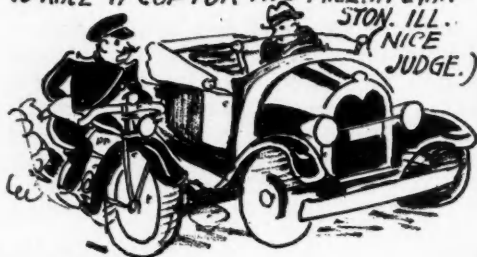
It is a product of the Lee Engineering Co. of Dayton, Ohio, and sales are handled exclusively by Reynolds & Reynolds.





# Automotive Oddities—By Pete Keenan

IT COST THOMAS HART \$200. A MILE TO RACE A COP FOR TWO MILE. IN EVANSTON, ILL. (NICE JUDGE.)



SEVERAL FISHERMEN LOST AT SEA WITHOUT GASOLINE HAILED A PASSING SHIP AND FOUND IT WAS A STANDARD OIL BOAT WITH TWO 100,000 GALLON BARGES IN TOW. 1931.



TWO CHICAGO CAR DRIVERS, BILL KISER AND JOE BRUSSE, DROVE A RACE BLINDFOLDED. 1932.

QUEER LOOKING PLANE, BUILT BY BEN BROWN, OF LAWRENCE, KANSAS, AND IT REALLY FLIES.



## The NEWS TRAILER

Write us if you know an oddity

"Hey, you, pull over to the curb. Trying to break a speed record?"

"No, I'm not trying to set a record here, but I'm in a hurry to get to Algonac to try to set a record on the river. My name is Gar Wood."

"Go ahead, and good luck. I hope you succeed," said the mounted policeman.

Five hundred blacksmiths in convention assembled in Toronto estimate that horses are about as numerous as in 1890. Horsey statistics are meagre, but the anviliers say that 13,000,000 are gainfully employed—and after all that means 52,000,000 shoes when the old ones wear out.

Rail-truck coordination in India is predicted. Since the government owns the rail systems and the highways, speed is expected.

Pity the motor bandits of Reigate, a Surrey town near London: Sir Malcolm Campbell, who did a stretch at 253 m.p.h., has been deputized as a volunteer constable.

Ab Jenkins chalked up a new U. S. record for 24 hr., when he put 2710 miles on his Pierce-Arrow 12 roadster on an improvised track on the salt beds of Salduro, Utah, under auspices of the Salt Lake City Chamber of Commerce.

He didn't leave the car or his seat during the run, and stopped only for fuel, etc. The stock car was equipped with racing tires, high compression head, special gear ratio, extra gasoline capacity, a deflector instead of the windshield and the fenders were removed.

For the second successive year Campbell-Ewald Co. won first award for the best outdoor poster of the year, sponsored by the Chicago Chamber of Commerce. The award was made on the poster showing two red robins and entitled, "It's Spring—Get a Pontiac."

Last year the agency won first prize for a poster prepared for Buick, entitled, "Boy, That's Traveling."

Four of the 12 posters to receive honorable mention this year were by Campbell-Ewald—three for Chevrolet, and one for General Motors spring shows.



# NEWS

## Vehicle Sales May Exceed July Total

Polk Report of 27 States Registrations Show 1/2 of 1% Gain

DETROIT, Sept. 19—Truck and commercial car sales in the United States in August equaled or slightly exceeded such sales in July, according to estimates by R. L. Polk & Co., compilers of official automobile registrations throughout the United States.

Registrations in 27 states, thus far reported, showed sales in those states in August of 7412 new trucks and commercial cars. This total was .53 per cent in excess of the 7373 units registered in July but 41.89 per cent less than the 12,754 units registered in August, 1931.

Inasmuch as the reporting states normally represent 50.05 per cent of the national total, it was estimated that August sales would reach 14,800, as compared with 14,731 in July and 27,070 in August, 1931.

New passenger automobile sales in the first 26 states to report for August produced registrations of 49,835 units. This total was 9.66 per cent below the 55,163 units registered in the same states in July and 39.77 per cent below the 82,743 units registered in those states in August, 1931.

## Sir William Letts Predicts Small Car

Wilys - Overland Executive Sees Need for Transportation "Without Frills" for Future

TOLEDO, Sept. 21—Smaller motor-cars designed for economy of operation and to furnish transportation without frills in keeping with present-day wage levels are forecast by Sir William Letts, managing director of Willys-Overland Crossley, Ltd., Manchester, England, here last week for conferences with John N. Willys, chairman, and other officials of Willys-Overland.

He said the general business atti-

tude was better throughout the world. Great Britain is leading the upswing, and the new prosperity with all countries coming out of the depression at once and under good control would produce in time the greatest business tide the world has ever known.

Sir William declared Mr. Willys has accomplished marvelous results in the brief time that he has been back on the job. He said the general public would be amazed if it could know confidential details of Mr. Willys' achievements in the last few months.

## Four Production Stopped by Ford

Six Expected, As Detroit Observers See Unusual Activity in Development Work

DETROIT, Sept. 22—Virtually complete discontinuance of its four-cylinder line by the Ford Motor Co. seems to be indicated by stoppage of releases to parts suppliers some time ago, and failure to renew orders following the resumption of manufacture at the River Rouge plant early this month.

It is readily apparent that changes in the Ford lines are contemplated for the near future, and indications are that there will either be a new lower-priced four-cylinder line, or that a six-cylinder engine will be adopted in place of the four in passenger cars.

The latter looks more promising at present, judging from the activity being put into development work in connection with a six-cylinder engine.

## Jordan Plant Sold

CLEVELAND, Sept. 22—Plant and assets of the Jordan Motor Car Co. were sold yesterday for \$150,000. John McArdle, formerly vice-president and later receiver, handled the negotiations.

The company was incorporated on March 13, 1916, and was reincorporated June 11, 1919. The property includes about 8 acres, improved with modern factory plants of about 135,000 sq. ft.

## Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

NEW YORK, Sept. 22—The decline in the stock and commodity markets continued last week without detracting materially from the optimism throughout the country.

There was some improvement in both wholesale and retail trade, the result mostly of the cooler weather. The large department stores are reported to be increasing their purchases in some lines.

The textile and shoe industries continued to make the best showing.

### FREIGHT LOADINGS IMPROVE

Railway freight loadings during the week ended Sept. 3 showed a further slight improvement. The total for that week was 559,727 cars, which marks an increase of 21,754 cars above those during the preceding week, but a decrease of 200,144 cars below those a year ago and a decrease of 296,922 cars below those two years ago.

### ELECTRIC PRODUCTION OFF

Production of electricity by the electric light and power industry of the United States during the week ended Sept. 1 was 8.7 per cent below that in the corresponding period last year.

### FAILURES INCREASE

Although the low point for the year in commercial failures is usually reached during August or September, this was not the case in the failures for August, according to R. G. Dun & Co.

The total for that month stood at 2798, as against 2596 for July and 1944 a year ago.

### FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices for the week ended Sept. 17 stood at 62.9, the first decline in five weeks, as against 63.2 the week before and 62.5 two weeks before.

### BANK DEBITS DOWN

Bank debits to individual accounts outside of New York City during the week ended Sept. 14 were 38 per cent below those a year ago.

### STOCK MARKET DOWNWARD

The stock market last week suffered a continuation of the downward course of prices during the preceding week, although there has been practically no change in fundamental conditions since the recent upward movement began.

There were some strong upward reactions, but they were followed by further weakness. The volume of trading was heavy, although it decreased as the week progressed. The majority of issues show large net declines.

## Continental to Build Low-Priced Automobile

DETROIT, Sept. 22 (Special)—W. R. Angell, president of Continental Motors Corp., announced that, within 90 days, a low-priced line of automobiles will be introduced by his company.

It will be produced almost entirely in plants of Continental and Hayes Body Corp.

The car will be priced lower than any standard-sized automobile on the market now.

# Wood Brings Speedboat Record Back to U. S. With 124.91 m.p.h.

Veteran Commodore Batters  
Kaye Don's Recent Mark By  
Nearly Five Miles at Algonac

## World's Automotive Speed Records

Seaplane—408.8 m.p.h., Lieuten-  
ant G. H. Stainforth.  
Landplane—293.193 m.p.h., Ma-  
jor James H. Doolittle.  
Automobile—253.968 m.p.h., Sir  
Malcolm Campbell.  
Motor boat—124.91 m.p.h., Gar  
Wood.



Left—Kaye Don and Gar Wood chatting about fast motor boating before the recent British International (Harmsworth) Trophy races in Detroit. Above—Wood, who broke the world's speedboat record

DETROIT, Sept. 20—The world's speedboat record returned to the United States today, at Algonac, when Gar Wood drove his brown-hulled Miss America X over the waters of Lake St. Clair at an official average speed of 124.91 miles an hour.

Roaring over a measured mile straightaway in two dashes, Wood shattered Kaye Don's mark of 119.81 miles an hour that had been made on July 18 at Loch Lomond, Scotland, in Miss England III.

On the upstream run against the current, Miss America X showed 124.41, and on the downstream flight 125.42.

Wood said he had shattered the mark with the 6400 hp. Packard engines under restraint. The 48-cylinder powerplant spun the propellers at 2500 revolutions per minute, 200 revolutions fewer than they can be turned with safety.

Twice before this week Wood had been blocked in attempting the record when conditions were not at their best. An unofficial dash yesterday was timed in 126.92, the fastest speedboat run ever made. This may influence him to seek even faster time in Florida this winter. On this point Wood was uncertain.

Miss America X was towed out from her Algonac boat well this morning and rested on the surface of Lake St. Clair while the grayhaired Wood tuned up the motors. Satisfied that everything was running smoothly the American ace pointed his boat downstream and made a few pre-

liminary turns out of sight of the timers.

Wood had twice beaten Don for the Harmsworth trophy, but had been unable to exceed the Briton's world's record until today.

Wood, however, was not completely satisfied. He made one other run, an upstream trial, in the hope that this would better his original attempt to pair with his magnificent 125.42 on his second trip. In this, though, he was doomed to disappointment. The clock showed 122.17, still better than Don's old record but inferior to either of the two other flights he had made previously.

## Two Years of Speed Duels

For the past two years the battle of motor boat speed supremacy has been a duel between two Miss Englands and two Miss Americas. In the course of this struggle the world's record has been stepped up 26 miles an hour, this difference being more than the world's record several decades ago when motor boating was in its infancy.

The late Sir Henry Segrave piloted Miss England II to a mark of 98.76 miles an hour on June 13, 1930, over the waters of Lake Windermere in England. This lasted for almost a year since the record was not shattered until March 20, 1931, when Gar Wood wrested the supremacy back for the United States by driving Miss America IX at a 102.256 clip at Miami.

Don had been the first man in history to travel on the water at a speed better than two miles a minute. On his second run at Loch Lomond he had been caught in 120.50 miles an hour. But today Wood traveled at a faster clip on all three attempts.

At that time Wood ignored all temptation to regain the world's record from the English driver, since his heart was set on winning the Harmsworth Trophy from Don early this month.

"I think we will wait until after the Harmsworth race is over before making the straightaway run," Wood was quoted as saying then.

These figures endured less than two weeks. Miss England II again eclipsed the record but on this occasion Kaye Don was at the wheel. Over a measured mile course on the River Parana near its junction with the River Platte near Buenos Aires, the British boat traveled 103.49 miles an hour.

Again on July 9, 1931, Don eclipsed his own record when he drove the same boat 110.223 over a course on Lake Garda in Italy. On Feb. 5 of this year Wood reclaimed the record when he sent Miss America IX at a speed of 117.12 over the Indian Creek water course at Miami.

On July 18 Don drove the new Miss England II of Lord Wakefield at a speed of 119.81 on Loch Lomond in Scotland. Then came Wood in his new Miss America X to add nearly five miles an hour to these figures.



# Willys-Overland to Build International Harvester Trucks

**Contract Calls for Half-Ton, Six-Cylinder Vehicles to Be Built in Toledo: Move Seen As Forerunner of Important Development**

TOLEDO, Sept. 19—A contract for manufacture by Willys-Overland of a ½-ton, six-cylinder truck in considerable quantity for the International Harvester Co. of America, announced here today through L. A. Miller, president of Willys-Overland, is believed to be the forerunner of a most important working arrangement in the automotive industry.

President Miller has been negotiating with the Harvester executives since January.

He said the deal will be of "incalculable value" to Toledo through increasing employment here not only in the Willys-Overland plant, but in more than a dozen plants making parts.

"It is contemplated that the line of trucks will include several different body types," he said. "This entire production in our plant in Toledo will provide a lot of work. Production will go forward very soon and as rapidly as tooling of the plant can be effected."

It is understood that the Harvester company expected to announce through its dealers the complete specifications and details of the new vehicle about Oct. 1.

For the last three years Willys-Overland Co. has been faced with trying conditions, but President Miller is credited with having worked costs of production down to new low levels and achieved accurate control of manufacturing operations. John N. Willys, chairman of the board, who recently returned to active duty, has been spending most of his time on financial problems, and in building the dealer-sales organization.

It is anticipated here that the new arrangement with International Harvester will give the company added prestige among its own dealer organization.

August production of the new streamline series has been reported as 1800 cars with a schedule for September of 2500 cars.

Among Toledo concerns which stand to benefit by the new sales and manufacturing deal with International Harvester are: Electric Auto-Lite, Mather

Spring, Gordon Mfg., Mountain Varnish, Tillotson Mfg., Champion Spark Plug, Moto Meter Gauge & Equipment, Spicer Mfg. Corp., and several others.

George A. Ranney, vice-president of Harvester, from Chicago, issued the following statement.

"International Harvester Co. is now making final tests here of a ½-ton, six-cylinder truck to be manufactured to its specifications by the Willys-Overland Co. of Toledo, to be marketed by the Harvester company through its sales organization and under its name.

"For several months our engineers and those of the Willys-Overland Co. have been working on the development of a light truck to complete our motor truck line. Final road and block test of experimental units jointly developed by the engineers of the two companies now are being made. Thus far the results of these tests have been satisfactory.

"It is believed that a favorable decision will be promptly reached and these new trucks will be put on the market as soon as new tooling equipment can be provided."

The International Harvester Co. in its 200 branches last year employed more than 35,000 persons.

The company sold 20,000 large trucks last year and has found active demand for a lighter truck.

"For several months," said George A. Ranney, vice-president of the Harvester company, "our engineers and those of the Willys-Overland Co. have been working on the development of a light truck to complete our motor truck line.

"Final road and block tests of experimental models jointly developed by the engineers of the two companies are now being made. Thus far the results of these tests have been satisfactory.

"It is believed that a favorable decision will be promptly reached and that this new model will then be put on the market as soon as the necessary new tooling equipment can be provided."

National Air Pilots Association.

Mr. Egge was transferred in 1918 to the Postmaster General's offices in Washington. Two years later he was named Superintendent of Air Mail Transportation, and he became General Superintendent in June, 1921.

It was Mr. Egge who laid out the scores of landing fields from coast to coast for the original United States air mail system.

## To Hold Sessions On New Products

**Cleveland Engineers Will Meet Sept. 27-29**

CLEVELAND, Sept. 22—A new products conference will be organized by the Cleveland Engineering Society when an introductory meeting will be held on Sept. 27.

There will be both morning and afternoon sessions at the headquarters of the Cleveland Engineering Society on Sept. 28 and 29, at which papers on the following subjects will be read and discussed: Conducting New Product Research; Changing Product Design to Changing Buying Habits and Tastes; Adapting the New Product to Existing Lines and Plant Facilities; Measuring the Market; Financing the New Product and Introducing It Effectively on the Market.

It is planned to combine an exhibit of new products and of models and drawings of same with the conference. The exhibits will be staged in the lobby of the society's headquarters and around the walls of the meeting room.

## Yaroslavl Tire Factory Built

MOSCOW (*Special*)—Building operations on the Yaroslavl tire factory, a part of the Soviet rubber combine, was completed in August, and the installation of equipment is well under way.

This factory is said to be the largest of its kind in Europe and operations in it are expected to begin in October.

It is designed to employ about 5000 people and to produce six and one-half million automobile tires annually.

## South Carolina Gas Taxes Off

COLUMBIA, S. C., Sept. 21—Gasoline tax collections in this state for the month of August totaled \$528,877.97.

Collections for August of last year, amounted to \$654,638.81; for the first eight months of 1932, \$4,186,981.81; first eight months of last year, \$4,735,923.04.

## Dura Assets To be Sold

TOLEDO, OHIO, Sept. 21—Assets of the Dura Co., manufacturer of automobile hardware, will be sold Sept. 29, under a court order issued by Federal Judge George P. Hahn. Appraisal as of June 30 sets a valuation of \$532,374 on assets.

J. W. Lyons and L. W. Rohr, receivers appointed two months ago, were named special masters to conduct the sale.

The receivers have admitted claims existing against the company amount to \$550,565.

## Carl F. Egge

Carl F. Egge, 60, who began his career in 1892 as a mail clerk and later played a prominent part in establishing the greatest air mail system in the world, died in Minneapolis Sept. 14.

From 1921 until 1925 Mr. Egge was general superintendent of the United States air mail service. At his death he was executive secretary of the



## Steel Mills Expect Increase in Orders

Early Turn in  
Automotive Business  
Seen By Makers

NEW YORK, Sept. 22—The pace of automotive buying of steel continues little changed for the time being, business being placed in a routine way for immediate requirements only.

Greater activity at the primary mills supplying semi-finished to the rolling departments indicates, however, that steel producers are preparing for an early increase in orders.

While the final arbiter of the extent of steel buying by automotive consumers is the car-buying public, the large steel producers are privy to the expectations and plans of their regular customers and their putting into operation one unit after another with a view to being able to fill orders promptly, when they do begin to come through in better volume, reflects something more definite than a mere hunch that business will be more on the up and up from now on.

The latest statistical report of the National Association of Flat Rolled Steel Manufacturers shows that sales in August held their own, totaling 66,132 tons, compared with 66,301 tons in the preceding month. Unfilled tonnage at the beginning of September was slightly higher than a month previous.

While a slightly easier tendency is reported in some of the scrap iron markets, heavy melting steel and other descriptions advanced 25 cents a ton in Detroit, the rise being due to the paucity of the supply because of the light output of scrap by motor car plants at this time.

**Pig Iron**—Quiet. Prices unchanged. **Aluminum**—Automotive demand during the first half of the month was light, but specialists look for some improvement in buying during the last week of the month.

**Copper**—Amid very little consuming buying the market remains stationary at 6½ cents, delivered Connecticut Valley.

**Tin**—Dull and weaker. Straights tin was quoted at the beginning of the week at 23½ cents.

**Lead**—Quiet and unchanged at 3.60 cents, New York.

**Zinc**—Slightly easier at 3¼ cents, East St. Louis.

## Foy Heads Auto Chamber Advertising Committee

Appointment of Byron C. Foy, president of the DeSoto Motor Corp., as chairman of the advertising committee of the National Automobile Chamber of Commerce, was announced today by President Alvan Macauley.

## July Tire Shipments 77% Under June

NEW YORK, Sept. 21—Shipments of pneumatic casings for the month of July amounted to 2,404,095 casings,

a decrease of 76.8 per cent under June this year, and were 56 per cent below July, 1931, according to the Rubber Manufacturers Association, Inc.

Production of pneumatic casings for July were 3,616,829, a decrease of 35.9 per cent under June this year and 26.6 per cent below July, 1931.

Pneumatic casing in the hands of manufacturers July 31 amounted to 6,202,856 units, an increase of 34.1 per cent above June 30, but were 37.5 per cent below July 31, 1931.

The figures are:

PNEUMATIC CASINGS			
	Ship- ments	Pro- duction	Inventory
July, 1932	2,404,095	3,616,829	6,202,856
June, 1932	10,366,640	5,643,329	4,625,021
July, 1931	5,461,908	4,926,484	9,919,456

## Receiver is Named For Pratt Chuck

Friendly Action Filed  
in Utica Federal Court

UTICA, Sept. 21—The Pratt Chuck Co., manufacturer of tools, machinery and appliances, Frankfort, is in the hands of a friendly receivership, according to an equity action on file in United States District Court here. It is understood the business will be re-organized.

Winthrop T. Skarritt, president of the company, was appointed receiver by Federal Judge Frederick H. Bryant and was authorized to continue business temporarily.

Pratt Chuck Co. was organized many years ago and leased land from the New York Central Railroad on which are buildings valued at \$194,000, according to the balance sheet of June 30.

## Canadian Ford Plant Reopens

EAST WINDSOR, ONT., Sept. 21—Operations have been resumed by Ford Motor Co. of Canada, Ltd., with a force of approximately 4000 employees, the same number as were employed prior to the two weeks' vacation shutdown.

Plants are working five days a week.

## Water Sanding Announces Aluminum Grinding Disks

Water Sanding Disc Co., Detroit, has developed and is placing on the market shortly grinding wheels and disks designed specifically for the grinding of aluminum and aluminum alloys.

It is claimed that the binder which has been developed for this wheel or disk makes it non-glazing and non-loading; that it can be used either dry or wet, and that it does not require dressing.

At the present time a few wheels are used by foundries engaged in the manufacture of non-automotive articles of cast aluminum.

## G. M. Reports Show Sales Up

Canadian Exhibition  
Attendance Showed  
More Interest

OSHAWA, ONT., Sept. 22—Substantial increase over last year in sales of new automobiles at the Canadian National Exhibition, Toronto, is reported by General Motors Products of Canada, Ltd.

Up to eve of closing day, the number of sales was considerably ahead of the sales at the 1931 Exhibition, and in addition there was a remarkable display of interest in the automotive exhibit, which leads C. F. McTavish, general sales manager, to believe that steadily increasing sales activity may be expected.

"Our sales at the Exhibition last year," said Mr. McTavish, "were good, but we far out-stripped the total this year and this in spite of a considerable drop in exhibition attendance.

"To my mind it is a most encouraging sign and I cannot help but think that at least some of the public who were holding off for one reason or another are at least beginning to buy.

"The cars sold at the Exhibition this year are by no means all in the low price bracket, in fact half a dozen Cadillacs were sold during the Exhibition."

## Canadian Raybestos Making Additions

PETERBORO, ONT., Sept. 17—The Canadian Raybestos Co., Ltd., is making two additions to its plant at Peterboro, Ont.

They will be one story in height, one 39 x 80 ft., and the other 60 x 150 ft., both with concrete foundation and brick walls.

## Knapp Elected to McQuay-Norris Board

H. W. Knapp was elected to the board of McQuay-Norris Mfg. Co. at the last meeting of the board of directors of the company, filling the vacancy caused by the death of John F. Green.

Mr. Knapp has long been a member of the organization as general sales representative. His new title will be director of sales.

The meeting also declared the regular quarterly dividend of 75 cents a share.

## Ingersoll Licenses Allegheny

CHICAGO, Sept. 22—Following the recent announcement that Ingersoll Steel & Disc Co. (a division of the Borg-Warner Corp.), had perfected a commercially successful two-ply stainless steel, Allegheny Steel Co., Brackenridge, Pa., has been licensed to manufacture two-ply stainless sheets exclusively under the patents of the Ingersoll Co.

# Says Discriminatory Automobile Taxes Block Trade Recovery

Alfred Reeves Tells Pennsylvania Dealers Car Is Taxed 20% of Its Value By 27 Forms of State and Local Levies in United States

HARRISBURG, Sept. 19—Exorbitant and discriminatory taxation of motor vehicles is one of the major obstacles to business recovery, according to Alfred Reeves, vice-president of the National Automobile Chamber of Commerce, at the meeting of the Pennsylvania Automotive Association here today. He called for taxes, when necessary, to be applied to all alike.

"The practice of plucking the motorist by loading him with more taxes whenever government needs additional revenue is handicapping the efforts of the automobile industry to perform its normal function as a leader in the restoration of business," he asserted.

"The car is now the most highly taxed piece of property in the world because it is taxed 20 per cent of its average annual value during its seven-year life.

"While Mobile, Alabama, is an extreme case, it is worth noting that the buyer of an average automobile costing \$750 at retail, is faced with a tax of \$97.31 the first year of operation.

"I don't know what more forms of taxation can be laid on the motor industry because almost every kind would seem to be included in the 27 that at one place or another in this country are laid on the user of the highway.

"Here is the list:

"Federal Excise Taxes: New motor vehicles, repair parts and accessories, gasoline, lubricating oil, and tires.

"State Taxes: Registration fees, operators' or chauffeurs' licenses, certificate of title, gasoline tax, personal property tax, ad valorem tax, horsepower tax, weight tax, gross or net, financial responsibility or compulsory insurance, ton-miles tax—gross, net, capacity or other, gross receipts tax, mileage tax, franchise tax, seating capacity, occupational tax, sales tax, and kind of tires used.

"County Taxes: Gasoline, and registration fees, etc.

"Municipal Taxes: Gasoline, registration fees, etc., and operators' license.

"This is not difficult to prove," Mr. Reeves continued. "In July, after the new Federal taxes on automotive products became effective, the output

of American car makers dropped to 118,611 units, or 38 per cent under the June production.

"While a portion of this decline in business may be traceable to seasonal factors, there can be little question but that the enactment of the new tax was responsible for a large per cent of the loss.

"There is another good example of the effect of taxation upon highway usage right here in Pennsylvania," Mr. Reeves said. "About three years ago the legislature here increased the gasoline tax from three to four cents a gallon.

"In May of the following year this tax produced \$2,681,000 for the state. Shortly afterwards, the tax was reduced to three cents, and the following May this lower tax produced \$3,880,000. As a matter of fact, Pennsylvania realized greater revenue from a lower rate of taxation than it did from the higher rate."

The manufacturing division of the automobile industry, according to Mr. Reeves, is prepared to give car owners their fullest aid in opposing and obtaining relief from this unfair situation.

The problem of traffic safety deserves the increasing attention of automobile dealers, according to Mr. Reeves. "Here is another place where the future of highway transportation and the automobile industry is being threatened," he said.

"In some communities traffic hazards are so numerous that insurance costs are so high as to make this form of protection beyond the means of the average car owner.

"Highway transportation is not exempt from the fundamental laws of economics and its future expansion will depend to no small degree upon our ability to bring motor travel within the means of an increasing number of people."

Mr. Reeves related that numerous automobile dealers in many sections of the United States had discovered sources of profit in more intensive merchandising of accessories, parts and service.

Their success in exploiting possibilities which they had previously neglected, offered many examples which automobile dealers elsewhere might emulate.

\$252,562 and by reducing the stated capital from \$4,445,223 to \$2,251,685.

If this action is approved, the company plans to write off the balance sheet such items as good-will, patents and trade names, now carried at \$312,544, and also to write off entirely the values of tools and dies.

## Chrysler Sales Continue Strong

New Car Registrations Show Increases, Report

DETROIT, Sept. 19—Registrations of new cars for 31 states in July, representing over 61 per cent of the total U. S. registrations, show that Chrysler Motors continues to be the only company whose products have been registered in greater numbers this year than last, it is stated by B. E. Hutchinson, vice-president and treasurer of the corporation.

For the year to date, including all states for the first six months, and 31 states for July, the registration of Chrysler Motors cars is 104.3 per cent of the registrations for the same cars and the same states during the same period of 1931.

This compares with 55.9 per cent for the entire industry, and raises the standing of Chrysler Motors cars in the industry from 9.3 per cent in 1931 to 17.5 per cent this year.

## German Production Decreased 40%

BERLIN (Special)—During the first half of the current year German production of passenger cars amounted to 22,116 units, a reduction of 40 per cent from the figure for the corresponding period of 1931. The number of trucks manufactured was 3928, a reduction of more than 50 per cent. Exports, however, increased from 1019 vehicles during the first half of 1931 to 4222 during the first half of this year.

## Walker Leaves Devereaux, Is Now Consulting Designer

George W. Walker has resigned his position as art director and design stylist for the Devereaux Corp., Detroit, after serving two and one-half years in that capacity. He will take up new duties as manufacturer's representative and industrial designer in Detroit.

Prior to his connection with Devereaux, he was automobile and fashion illustrator in Los Angeles and Cleveland and designer of automobile bodies for General Motors and Graham-Paige.

## Ottom Joins Lubriplate

Alfred S. Ottom, formerly divisional sales manager of Moto Meter Co., Long Island City, and recently sales executive of New York Lubricating Oil Co., is now in charge of sales and distribution for the Lubriplate Corp. of New York City for southern New Jersey, eastern Pennsylvania, Delaware, Maryland, District of Columbia, Virginia, West Virginia, North and South Carolina and Tennessee. His headquarters are in Philadelphia.

## Sparks - Withington Co. Plans to Reduce Capital

DETROIT, Sept. 21—Stockholders of Sparks-Withington Co. will vote on a proposal to reduce capital by retiring 12,850 treasury shares amounting to



## Canadian Parliament to Receive Taxation Details Oct. 13, Report

Opening Oct. 6 to Be Followed Week Later By Reading of Budget By Finance Minister Rhodes, Augmenting Imperial Conference Agreements

by M. W. Gladish

TORONTO (Special)—Following the definite announcement that the 1933 session of the Canadian Parliament would open Oct. 6, as previously reported in *Automotive Industries*, details of new taxes, tariff revisions and preferences will be revealed one week later, Oct. 13, when the budget provisions will be read by Hon. Ernest Rhodes, Minister of Finance.

The Rhodes resolutions will augment the trade agreement between the United Kingdom and Canada, adopted at the Imperial Economic Conference in Ottawa on Aug. 20.

The additional terms under this agreement will be announced simultaneously at Ottawa and London, according to information secured by your correspondent, and they will be specific with regard to tax and tariff amendments affecting the automotive industries of Canada, the United Kingdom and the United States.

Based upon official intimations at the Imperial Conference, the changes will probably include:

Increased preference for British cars, truck chassis, tractors, engines, parts and electrical equipment by the reduction of duty on these imports into the Dominion.

Free entry of British motorcycles into Canada.

An official definition of "Empire Content" with perhaps an increase in the percentage of content requirements, and modifications with regard to the application of the Canadian dumping duty and the arbitrary method of fixing the value of the pound sterling for duty purposes.

Similarly, exact terms under the new trade treaties between Canada and South Africa and southern Rhodesia will also probably be announced, while it is expected that the United Kingdom will announce concessions which will prove advantageous to Canadian automobile manufacturers in exports to Great Britain.

Because of the wide possibilities, the Canadian Automobile Chamber of Commerce is preparing to have representatives on the scene in Ottawa during the coming session which is ex-

pected to occupy a period of four weeks before adjournment to February.

### U. S. Establishing Canadian Plants

American manufacturers apparently are not waiting for pronouncements at the coming session of the Canadian Parliament which may have considerable effect on both domestic and foreign trade.

An industrial survey shows that 155 branch factories of all kinds have been established in Canada during the past six months. Of these 145 are plants of companies having their headquarters in the U.S.A. and the remainder are branches of firms in Great Britain.

The development has occurred almost entirely in central Canada. No less than 142 out of the 145 American branch factories have located in Ontario and Quebec. There are 101 in the Province of Ontario, with 70 in Toronto alone, while 41 have located in the Province of Quebec, of which 20 have gone to Montreal.

Tariffs and rates of exchange have had a great deal to do with the industrial movement to Canada. The Dominion has access to various British and foreign markets which are practically denied to the United States because of tariff walls and the premium on the American dollar.

In this connection, a report of the Bureau of Statistics shows that 1027 branch plants of United States industries are operating in Canada. All are in a position to take advantage of preferences and, incidentally, they will be affected by revisions which will be passed upon by the Canadian Parliament.

Scarcely a week passes in Toronto without the announcement that three or four U. S. manufacturers of automotive parts and accessories and garage equipment have leased factory premises or have bought ground for the erection of a factory for the Canadian and foreign trade.

The automotive industry seems to be the leader in this respect although food, textile, wood and chemical products also figure in the list substantially.

### University Offers Aero Engineering

TOLEDO, Sept. 20—The University of Toledo will offer a survey course in aeronautical engineering this year, it was announced today by D. N. Palmer, in charge of the engineering department. D. C. Maier will be in charge of the course.

### August Chevrolet Sales Show Gain

29,230 Vehicles Sold Compared With 26,549

DETROIT, MICH.—Chevrolet dealers reported the sale of 29,230 new cars and trucks in August as compared with 26,549 in July, according to H. J. Klingler, vice-president and general sales manager of the Chevrolet Motor Co.

Every one of the three 10-day reporting periods in August revealed a gain over the corresponding periods of July, Mr. Klingler said. The last 10-day period was the largest for the month, with 12,126 new cars and trucks delivered to consumers, compared with 11,843 in the corresponding July period.

Thus the company entered September, normally much better from a sales standpoint than August, on a rising sales curve.

While August was showing a 10 per cent gain over July, field stocks of both new and used cars were greatly reduced during the month, Mr. Klingler said, the reduction in new cars amounting to more than 4000 units in the last 10 days alone, and the used-car reduction amounting to nearly as many units.

The result is that present field stocks of used cars are lower than they have ever been at this season of the year since the Chevrolet dealer organization grew to its present size, Mr. Klingler stated.

### Chevrolet Leads In Truck Registrations

DETROIT, Sept. 21—Chevrolet Motor Co. led in the sale of commercial cars for the first six months of this year, with 36,049 of the 100,564 units for the industry, or 35.8 per cent of the total output of 33 truck manufacturers.

### Rubber-Base Paints Offered by Goodrich

AKRON, Sept. 21—A new line of rubber paints, known as Acidseal paints, has been marketed by the B. F. Goodrich Rubber Co.

The base of these paints is a commercial form of rubber isomer developed by the Goodrich laboratories, for which it is claimed that it imparts exceptional properties of adhesion when applied to a properly prepared surface; that it dries in one hour to a hard, firm film but retains the elastic properties of rubber to a remarkable extent, and that, since the well-known properties of chemical resistance of rubber are retained, the paints provide a protective coating that minimizes the corrosive action of acids, alkalies and chemical fumes.

The film is not water absorbent.

### Body Order Is Reported

DETROIT, Sept. 21—It is reported here that contracts have been signed by the Hayes Body Corp. to manufacture bodies for a low-priced line of cars to be produced by Willys-Overland Corp. While not immediately effective, it is expected the contract will expand Hayes operations before the year is out.



## Canadian Auto Show Attendance Off, But Buying Interest High

TORONTO, Sept. 19—Despite a drop in total attendance during the two weeks of the Canadian National Exhibition, Toronto, to 1,500,000, some 200,000 less than in 1931, the Automotive Show was considered relatively more successful in trade value than it was one year ago, even without an array of new models.

Speaking for the exhibitors, C. E. McIntosh, general sales manager of General Motors of Canada, Ltd., Oshawa, declared that the public gave definite indication of buying inclination. Actual orders booked during the show were approximately double the number secured at the 1931 display, while many inquiries were received as well.

The newest model on display was the Essex Terraplane. The only British car on exhibition was the Golden

Arrow racing automobile in which the late Sir Henry Segrave established a world's speed record. Vickers, Ltd., had a special exhibit in which was shown the Vickers Supermarine Rolls-Royce S.6B seaplane of Schneider Cup fame. Lodge Plugs, Ltd., had a booth in the Automotive Building, but all other automobiles, trucks and accessories were of Canadian or United States manufacture.

It had been thought that in view of trade discussions at the recent Imperial Economic Conference in Ottawa there would have been a number of British cars at Canada's national fair, but evidently the British trade push has been reserved to a later date.

The annual mid-winter automobile show is scheduled to be held in the Automotive Palace at Toronto next February.

## Frame Seen As 1932 Champion

Position Good Unless  
Another A.A.A. Race  
Upsets Statistics

DETROIT, Sept. 21—Unless another championship event is sanctioned by the A.A.A., Fred Frame, winner of the Indianapolis race, will also be 1932 champion, but by one of the narrowest margins in many years. With the results of the 100-mile race here Sept. 10 figured in, Frame, with his Hartz Miller Special, has a total of 710 points, followed by Bob Carey with 690 points.

In the race Frame finished ninth, and Carey finished seventh. If Carey could have finished fourth or better he would have passed Frame in total number of points, and for the first 50 miles or better Carey was leading the race. Having qualified for the pole position, Carey assumed the lead right at the start and drove the first half of the race with a heavy foot.

Too heavy, as it turned out, for his anxiousness wrecked his chances. At 51 miles he had to come in for water and oil, and later, when he came in for a tire change, it was also necessary to change his spark plugs—burned out during those fast 50 miles.

Frame's position way back in the race was also due to a pit stop early in the race with a broken or loose oil line or connection. After that Frame drove conservatively the rest of the race, intent on finishing.

Another change in the championship standing came about when Russ Snowberger, in his Hupmobile neostock car, finished 50 to pass Cliff Bergere in total number of points for fourth place—the third time in succession that Snowberger has finished in that position in the national championships.

Howdy Wilcox is in third place. He also had a chance for the championship Saturday, being only 80 points behind Frame. In the qualifying trials he stuck a piston, but Lou Schneider turned over his Bowes Fast Special to Wilcox to enable him to compete. Wilcox did not finish the race.

Winner of Saturday's race was Bob Rose, in a Litz Miller Special, at 74.4 m.p.h. for the rough dirt track. Bill Cummings, in a Boyle Valve Special, placed second. Three minutes behind the leaders came Al Miller in one of Buddy Marr's Hudsons. The other Hudson, driven by Chet Miller, finished eighth, making a fine record for the three stock cars entered, the two Hudsons and the Hupmobile.

## Tru-Stop Brake Offered

SOUTH BEND—Tru-Stop ventilated disk brakes can now be supplied as optional equipment on Studebaker trucks.

## Clark Equipment Offers Low Pressure Spoke Wheel

BUCHANAN, MICH., Sept. 21—A chrome metal spoke wheel for low-pressure balloon tires has been placed on the market by the Clark Equipment Co. of this city. It is said to embody elements of design which insure accuracy and balance; the light, hollow spokes are of graceful contour; the wheels are sealed against dirt, slush and ice, and they are said to be easy to clean.

The Clark chrome spoke wheels are available in burnished chrome finish of two types—with the spokes chrome and the rim black, and with the spokes chrome and the rim black except for the loose side ring, on QD tires, which is chrome. These wheels are also supplied painted black and with light decorative stripes on the spokes. They are available for 22 different makes of light cars.

These wheels are supplied to distributors with the hub flange undrilled, so that the distributor or dealer, with a set of simple drill jigs, can make the wheels available for all of the 22 different makes of cars. The wheels are also supplied specially drilled for replacement on any of the 22 makes of cars for which they are suitable.

## Gibbons is Director of Timken Steel Sales

The Timken Steel & Tube Co., Canton, has appointed Frank L. Gibbons director of steel sales.

Mr. Gibbons has been associated with various alloy steel manufacturers in sales capacities since 1914, when he was with the old Carbon Steel Co.

Later he was in sales work in Pitts-

burgh, Cleveland, Detroit and Massillon with the Central Steel Co. and the Central Alloy Co. He comes to Timken from the Republic Steel Corp., with which he has been connected since its merger with Central Alloy.

## Vanadium Shareholders Vote to Reduce Shares

NEW YORK, Sept. 20—At their annual meeting last week the shareholders of the Vanadium Corp. of America authorized a reduction in capital as represented by 378,367 1-3 shares by 3,938,002.

Alfred A. Corey, Jr., president, said there had been no pick-up in the business of the company, although some steel companies had asked if Vanadium could make prompt shipments if orders were given to it.

## Drop Forgers to Meet in Buffalo

CLEVELAND, Sept. 20—The American Drop Forging Institute is holding its annual meeting in Buffalo on Oct. 4 and 5 in conjunction with the American Society for Steel Treating at the Fourteenth National Metal Congress. This is an open meeting to the entire drop forge industry.

One of the most important subjects for discussion will be the survey of the drop forge industry which has just been completed by the United States Department of Commerce. This survey was sponsored by the American Drop Forging Institute, and it is the first time in the history of the industry that it has been able to assemble together basic facts pertaining to production, sales, capacity and many other statistics of equal importance to every drop forge executive.

## Pharis Adds New Plant Equipment

### Factory on 7-Day 24-Hour Schedule and Anticipates Big Demand

NEWARK, OHIO, Sept. 21—To take care of current increased demand for tires and to prepare for exceptional replacement requirements now anticipated as imminent, Pharis Tire & Rubber Co. has just installed an additional 500-hp. boiler with automatic stoker equipment.

This company, which is one of the oldest in the tire industry, has kept its modern, efficient plant in steady operation throughout the depression, and its alert merchandising methods have, during the past several months, required a 24-hr.-a-day, seven-day-a-week schedule to keep up with demand.

Carl Pharis, general manager of the company, states that he attributes the remarkable success of the company during a period of widespread distress in the tire industry to their strict adherence to sound principles of organization and finance, without deviation during the entire 20 years of the company's history.

"We have allowed no period of exceptional business to lead us into over-expansion of factory equipment or staff, nor indulgence in irreducible items of overhead expense. We have no branch offices or warehouses, but few salesmen, and no interest charges to pay on funded indebtedness.

"We have consequently been able to offer tires of highest quality at exceptionally low prices, and the widespread recognition of the values we offer has kept our dealers doing a nice business and kept our factory busy supplying them right through the depression."

## Missouri Begins Truck, Bus Arrests

JEFFERSON CITY, MO., Sept. 20—Last week saw the start of arrest and prosecution of violators of the new bus and truck law, passed by the last legislature.

Under provisions of the law, length of single vehicle and load is limited to 33 ft., and a combination of truck and trailer to 40 ft.

## Finds Crude Rubber Consumption is Down

NEW YORK, Sept. 20—Consumption of crude rubber by manufacturers in the United States for the month of August amounted to 22,372 long tons, as compared with 28,272 long tons for July, 1932, and represents a decrease of 20.9 per cent, according to statistics released by the Rubber Manufacturers Association today.

Imports of crude rubber for the month of August were 34,219 long tons, an increase of 10.1 per cent above July, 1932, but were 10.8 per cent below August a year ago.

Total domestic stocks of crude rubber on hand Aug. 31, at 357,342 long tons, which compares with July 31 stocks of 345,927. August stocks show an increase of 3.3 per cent, as compared with July of this year, and were 48.4 per cent above the stocks of Aug. 31, 1931.

The participants in the statistical compilation report 41,282 long tons of crude rubber afloat for the United States ports on Aug. 31.

## Firestone Announces Spanish Plant Plan

Harvey S. Firestone, Sr., returned to Akron last week with announcement that he had arranged for establishment of a new Firestone plant to manufacture tires in Spain.

The new plant will be located at Bilbao, and will employ about 500 men.

Spanish bankers agreed to finance the new factory, Firestone said, but the plant will be directed and operated by Firestone.

## Sir Herbert Blain Visits Seiberling

Sir Herbert Blain, director of the Avon Indian Rubber Co. of England, was in Akron last week to discuss the tire manufacturing business with F. A. Seiberling, president of the Seiberling Tire & Rubber Co.

The Avon company, building Seiberling tires and using Seiberling methods, increased its sales by 102 per cent during the business year just completed, Sir Herbert announced.

## Canadian Raybestos Building Additions

### Seeks More Business Under Conference Terms

TORONTO, Sept. 19—Work has been started on two additions to the plant of the Canadian Raybestos Co., Ltd., at Peterborough, in order to secure increased production of brake linings and packings for the British Empire market under the terms suggested by the Imperial Economic Conference.

The additions will be one floor in height, of concrete and brick construction, one being 60 by 150 ft., and the other 39 by 80 ft. The parent company is situated at Bridgeport, Conn.

## Russell to Preside at Canadian S. A. E.

T. A. Russell, president of Willys-Overland, Ltd., Toronto, will be the chairman of the banquet at the four-day convention of the Society of Automotive Engineers, to be held in the Royal York Hotel, Toronto, starting Oct. 4. Mr. Russell has the distinction of being the first Canadian member of the Society of Automotive Engineers.

## Battery Production Down

WASHINGTON, Sept. 21—The production of motor vehicle 9 to 21-plate batteries in 1931 totaled 11,441,681, valued at \$54,151,933, as against 15,655,568, valued at \$86,481,959 in 1929, according to reports from manufacturers received by the Bureau of Census.

## + + CALENDAR OF COMING EVENTS + +

### FOREIGN SHOWS

London, Olympia Show .....Oct. 13-22  
Glasgow, Scottish Motor Show...Nov. 11-19  
Paris, Aeronautical Show...Nov. 18-Dec. 4

### CONVENTIONS

Natl. Assoc. of Motor Bus Operators, Chicago .....Sept. 29-30  
American Electric Railway Assn., Chicago, Ill. ....Sept. 27-28  
Amer. Institute Mining & Met. Engrs. (Petroleum Division), Dallas, Texas .....Sept. 30-Oct. 1  
National Metals Congress, Buffalo .....Oct. 3-8  
S.A.E. Production Meeting, Buffalo .....Oct. 3  
Amer. Society for Steel Treating, Buffalo .....October 3  
Amer. Institute Mining & Met. Engrs. (Iron & Steel Division), Buffalo, N. Y. ....Oct. 3-6  
National Safety Council, Washington, D. C. ....Oct. 3-7  
American Welding Society, Buffalo, N. Y. ....Oct. 3-7

American Society Mechanical Engineers, Buffalo, N. Y. (Natl. Iron and Steel Meeting).....Oct. 3  
S. A. E. Annual Transportation Meeting, Toronto .....Oct. 4-6  
American Gas Association, Atlantic City (Annual) .....Oct. 10-14  
Natl. Hardware Assn. (Accessories Branch), Atlantic City, N. J. ....Oct. 17-22  
Natl. Tire Dealers Assoc., Atlanta, Ga. ....Nov. 14-16  
American Society Mechanical Engineers, New York City (Annual Meeting) .....Dec. 5-9  
Natl. Exposition of Power & Mechanical Engineering, New York .....Dec. 5-10  
Highway & Building Congress, Detroit .....Jan. 16-23

### SHOWS

Joint M.E.A. & N.S.P.A. Trade Show, Detroit .....Dec. 5-10  
National Automobile Show, New York .....Jan. 7-14, 1933  
National Automobile Show, Chicago .....Jan. 28-Feb. 4, 1933



# NEW DEVELOPMENTS

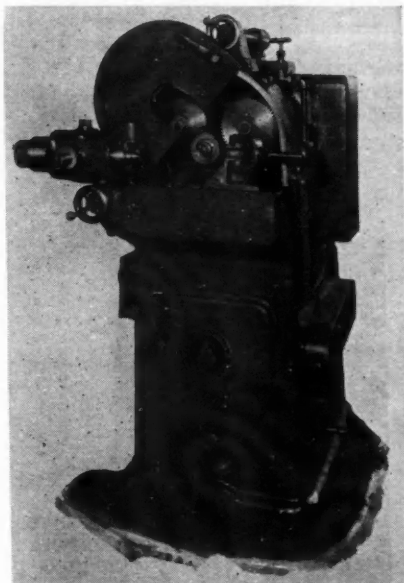
## Automotive Parts, Accessories and Production Tools

### Fellows Develops Gear Lapping

The Fellows Gear Shaper Company, Springfield, Vermont, has developed a new method of finishing gears by lapping after hardening, which in addition to smoothing the contacting profiles of the teeth, also removes slight distortions resulting from heat-treatment, thus producing more accurate, efficient, longer-lived, and quieter operating gears.

On helical gears the improvement made possible by lapping is particularly noticeable. The economy of the process lies in the fact that in the majority of cases the gears can be lapped in a few minutes. Furthermore, as this machine is automatic in operation, each gear is lapped for a definite period so that consistent results are not dependent on the skill of the operator. In practice all gears receive the same amount of lapping; they are then tested on speeders for quietness and bearing, and those which do not pass inspection are set aside and relapped. In this way gears can be lapped on a production basis at a comparatively low unit cost.

The principle of operation of this Gear Lapping Machine, which is known as the "3-Lap Recess Type," differs entirely from that of rotating gears with lapping compound introduced between the teeth. Its success does not depend simply upon the rotation of the work and laps to effect



the lapping action. It affords in addition a reciprocating movement of the work at a fairly high rate of speed. This effects an adequate distribution of the lapping compound over the contacting teeth, and results in much more efficient and rapid lapping action. The spindle which carries the work is positively driven through change gears, and the three laps are rotated by the action of the work. Independent and adjustable

friction brakes are applied to each of the three lap spindles so that the pressure of the laps on the work can be varied to suit conditions.

To change the pitch line contact of the three laps on the work, each of the laps can be made with a different number of teeth. The center distances of the work-spindle and the three-lap spindles are not adjustable, but through the medium of an independent mechanism the two upper lap spindles, which are mounted on self-aligning ball bearings, can be set at a slight angle with relation to the axis of the work.

This machine is designed for individual motor drive. A 2 hp. motor, 1200 r.p.m., mounted in the base drives the machine through a single pulley, and operates both the rotative and reciprocating mechanisms; also the lubricating pump and electric limit switch. A ½ hp. motor, 1800 r.p.m. mounted in the opposite side of the base drives the compound pump.

### No-Ro-Shox Self-Adjusting Bearing for Drag Links

No-Ro-Shox is the trade name of a new automatic self-adjusting bearing for automobile and truck drag links manufactured and distributed by the Wigginton Co. of Kalamazoo, Mich., to the replacement trade.

It is claimed to eliminate shimmy, wheel-fight, road shock and wandering, caused by loose drag links. No-Ro-Shox bearings are said to decrease the pressure on the drag-link bearings to a minimum, thereby eliminating some of the causes of hard steering, and excessive wear of steering worms, gears and ball joints. Once in place, they are said to require no further adjustment or attention. They are packed with grease and act with a receding thread, consequently dirt or dust will not freeze the automatic action. They can be used on a ball that is integral with the pitman or steering arm.

## Twenty Interlocking Levers Smooth Action of Lipe Automatic Clutch

(Continued from page 395)

adjustment, much of the evil of adjusting clutch has been overcome, according to the maker.

Another departure from the conventional design is the gear-tooth chamfering of the splines in the driven-plate hub. This is a great help in assembling the transmission to the clutch, as the shaft splines are quickly and easily piloted into the splines of the driven plate. The splines are chamfered on the well-known Lipe gear-tooth chamfering machine.

The Lipe clutch is a self-contained unit which is being manufactured in four different sizes of 11, 12, 13 and 14-in. diameter, the torque capacities ranging from 160 to 350 lb.-ft. No additions to the engine flywheel are required for mounting, the only requirement being the proper depth of flywheel and provision for bolting the clutch assembly in place. Either a ball thrust or a carbon graphite release bearing may be used.



# NEW DEVELOPMENTS

## Automotive Parts, Accessories and Production Tools

### Sundstrand Vertical Rotary Rigidmil

Fig. 1 shows a Sundstrand No. 3B Vertical Rotary Rigidmil with a 24 in. diam. rotary table, 26½ in. diam. table top, equipped with 12 independent interchangeable work-holding fixtures for the operation of machining the diagonal slot on aluminum pistons. Simultaneous with the machining operation a spring loaded hammer mechanism automatically stamps the word "front" on the head of the pistons as the work revolves.

An 8 in. diam. x ¾ in. x 1 in. high speed slitting saw having 110 teeth is used and a continuous production of 1600 pieces per hour is obtained.

Fig. 2 illustrates a Sundstrand No. 3B Rotary Rigidmil equipped with a 2-spindle head and a 24 in. diam. rotary table, also with an auxiliary drum cam unit to oscillate the table ¼ in., timed for 10 oscillations per revolution of the table. The operation is to mill

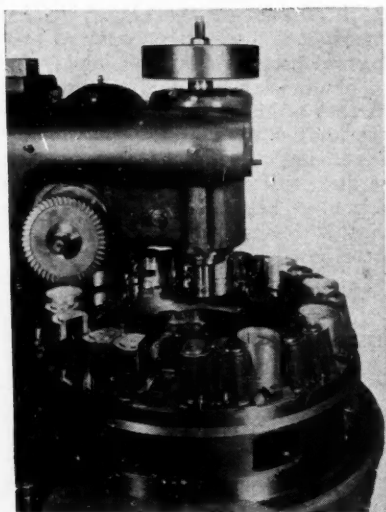


Fig. 1

the radius at the open end of the piston and to saw a slot in the third piston ring groove. For this operation 10 independent and interchangeable fixtures are used in connection with a special two-spindle milling head.

The piston is presented to this operation with the outside diameter turned and grooved, with the head faced, the wrist pin holes bored and the diagonal slot sawed. It is loaded into the fix-

ture with the closed end resting on steel locating plates and positioned by four steel locating plates seating on the outside diameter and by a spring clamp registering in the diagonal sawed slot. The piston is then auto-

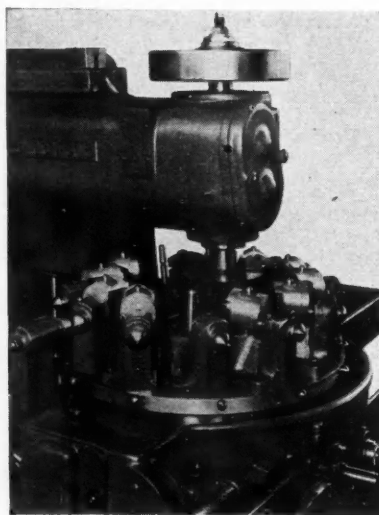


Fig. 2

matically clamped by means of two cam-operated spring loaded sliding fingers gripping in the wrist pin holes.

The radius is formed in the skirt end of the piston by the cutter on the horizontal spindle and the ¼ in. saw slot is machined by means of the cutter on the vertical spindle.

The horizontal spindle is mounted in a 6½ in. diam. eccentric quill with ¼ in. of eccentricity. The vertical spindle is mounted in a 5 in. diam. quill and is provided with micrometer adjustment for individually setting the cutter.

To mill the slot in the proper location in the piston it was necessary that the gash method of milling be performed, whereas to machine the radius on the skirt end of the piston it was necessary to use the continuous rotating method of milling. Therefore, by the adoption of the oscillating table as above described both methods of milling were accomplished simultaneously. The cutters are so arranged and the table is so timed that the oscillating motion takes place at the point where the radius milling cutter is between 2 pistons. Thereby the oscil-

lating movement has no effect on the radius milling operation. The rotary table is timed to rotate 1½ revolutions per minute to obtain a production of 900 pieces per hour. The vertical spindle revolves at 760 r.p.m. and the horizontal spindle at 610 r.p.m.

### Bundy Adds New Equipment

The Bundy Tubing Co., Detroit, has just installed a large Zeppelin copper hydrogen electric welding furnace, which promises to be revolutionary in its accomplishments, particularly when multi-welds and intricate assemblies have to be handled.

It is of the semi-continuous pusher type and entirely automatic. The unit is built in a steel shell 6 ft. in diameter and approximately 82 ft. long, the first 20 ft. being the heating chamber, which is bricked in the shell, and the next 60 ft. the cooler, which is jacketed for water cooling. To minimize heat losses into the cooler, the heating chamber and the cooler are connected by a rectangular throat which is built of fire brick and insulation. The dimensions of the throat limit the size of the work that can be sent through the furnace to 17 in. x 13 in. x 30 in.

The reducing gas is fed into the heating chamber at a point near the throat and flows out through the charging and discharging openings at both ends of the furnace. Nichrome ribbon resistors are mounted in loops on the side walls and on the floor of the heating chamber.

The work is carried on cars 2 ft. long, which are loaded on a lower conveyor running underneath the entire length of the furnace, and are pushed through the furnace on another double track disk-wheel alloy conveyor in a lower temperature chamber built beneath the floor of the heating chamber. The work is brought into the heat zone on supports which extend up from the cars through a longitudinal opening in the floor of the heating chamber.

An elevator at each end of the furnace brings the cars to the level of the upper and lower conveyors, and hydraulic pushers alternately move the train of cars on the conveyors one car length, and push the last car on the charging or on the discharging elevator.

### Cylinders Finished with Single-Pointed Tool

A note from Ernst Krause & Co., Germany, advises that this machine builder has recently introduced a heavy-duty single spindle, vertical boring machine for finishing cylinder bores. The chief feature of the arrangement is the use of a single point boring tool tipped with Widia. This "fine-boring method" is said to have met with success in German and English engine building plants.